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Estimating the Effect of Direct Democracy on Policy Outcomes: Preferences Matter!

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Abstract

Previous studies have found large negative effects of direct democracies on government spending. Since they do not control for preference heterogeneity, these estimates suffer from omitted variable bias. If citizens in areas with stronger direct democracy have lower tastes for government, the restraining effect of institutions is overstated. Exploiting a unique dataset in Switzerland, we demonstrate substantial preference heterogeneity across cantons with different direct democratic regimes. Conditional on voter preferences, the effect of direct democracy declines by more than 40 percent relative to earlier estimates. However, access to direct democratic instruments still decreases canton expenditures by 8 percent, while raising expenditures at the local level by 20 percent. In the Swiss case, a mandatory budget referendum decentralizes expenditures, but has no effect on the size of canton and local governments combined. Our results speak against a pure median voter model and strengthen the view that political institutions have a strong and persistent influence on policy outcomes.

JEL codes: H11, H50, H62, H70

Keywords: Institutions, Direct Democracy, Voter Preferences, Fiscal Policy, Switzerland

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1 Introduction

A large body of research has analyzed whether and how political institutions affect economic policy. Benefits and costs of institutions like the voter initiative in particular have been subject of an intense public and academic debate for more than two centuries.[1] In recent years, strengthening direct democratic participation has been on the agenda of such diverse political bodies as the European Union and several republics of the former Soviet Union. To evaluate the merit of these proposals requires a clear understanding of the effects of direct voter participation on policy outcomes.

Several previous studies have found that access to direct democracy has a negative impact on expenditures.[2] While some papers use panel data, the effect of direct democracy is largely identified from cross-sectional variation. This is a feature shared by many empirical studies on political institutions, which tend to be very persistent over time. If there are unobserved state-specific factors that are correlated with the policy outcome and the presence or absence of direct democracy, the estimates will suffer from omitted variable bias.

A prime candidate for omitted variables are the preferences of voters. A negative correlation between the availability of direct democratic instruments and expenditures can thus be interpreted in two ways: first, direct democratic institutions constrain budget-maximizing politicans in their ability to increase expenditures.[3] This has been the dominant reading in the literature. An alternative interpretation, that is equally consistent with the data, is that voters in more direct democratic states have a lower taste for government.[4]

[1] See Besley and Case (2003) for a comprehensive survey of the empirical evidence on political institutions. Recent examples on the debate over direct democracy include Gerber (1999) and Matsusaka (2004; 2005).

[2] Matsusaka (1995) and Bails and Tieslau (2000) report significant negative effects of the voter initiative on expenditures. In contrast, Zax (1989), Farnham (1990) and Besley and Case (2003) find little or no effect on government spending, and Matsusaka (2000) even reports a positive effect for the first half of the 20th century. For Switzerland, Pommerehne (1978) provided evidence that direct democracy decreased municipal expenditures. Similar results are reported by Feld and Matsusaka (2003) for cantonal expenditures and Feld and Kirchgaessner (2001) for public debt.

[3] For a theoretical justification of this interpretation, see Gerber (1996), Romer and Rosenthal (1979a) and for the Swiss context, Moser (2000).

[4] Pujol and Weber (2003) make a similar point. Though Peltzman (1992) provides some evidence that vot-

Without controlling for voter preferences, the coefficient on the institutional variable estimates a combination of preferences and institutional effect. If there is Tiebout sorting across regions, we expect the taste for government spending to be negatively correlated with the institutional regime. Omitted variable bias would then overstate the true constraining effect of institutions on policy-making. In the extreme case, access to direct democracy might have no effect on policies conditional on preferences. Previous studies therefore provide no conclusive evidence against the pure median voter model in favor of a more institutionalist perspective.[5]

In this paper, we use a new strategy to identify the effect of direct democratic instruments on fiscal policy. We exploit a unique dataset to directly estimate voter preferences from voting data on propositions. Our approach has three main advantages over that in the literature: first, we estimate preferences as revealed in actual voting behavior on policy issues rather than relying on what individuals say in opinion polls. Second, our estimation strategy is flexible enough to allow for multiple dimensions of heterogeneity among voters as well as changes over time. Finally, since all citizens vote on the same propositions, our estimated preferences are directly comparable across regions. Combining voter preferences with a rich dataset on fiscal policy, direct democratic instruments and social and economic characteristics from 1950 to 2000, we can estimate whether and how access to direct democratic participation affects fiscal policy conditional on voter preferences.

Our empirical analysis focuses on Switzerland, whose decentralized political structure and strong direct democratic tradition provides a unique setting to address this question. Switzerland's 26 cantons account for 40 percent of overall government spending and differ

ers punish politicians for high growth in welfare spending, Matsusaka (1995; 2000) shows that the assumption of fiscally conservative voters is not in general empirically valid.

[5] A second approach regresses expenditures or the existence of certain laws on measures of preferences constructed from opinion poll data (Camobreco, 1998; Gerber, 1996; 1999; Lascher et al, 1996). A larger coefficient on the preference variable in direct democracies is then interpreted as a higher responsiveness to voter preferences. However, as noted by Romer and Rosenthal (1979b) and Matsusaka (2001), this does not identify whether policies in direct democracies are 'closer' to those desired by the median voter.

widely in their provision for direct democratic participation. We classify cantons as strongly direct democratic with respect to fiscal policy if they have a mandatory budget referendum in place. The mandatory budget referendum requires voters to approve fiscal expenditures exceeding a certain threshold. In contrast, cantons with only an optional or no budget referendum either need to collect enough signatures or have no direct influence on fiscal policy.

We find that voter preferences differ between cantons with and without mandatory budget referendum over our sample period. While we identify at least 3 preference dimensions, only one is needed to describe preferences with respect to fiscal policy. Our evidence suggests that voters in cantons with strong direct democratic participation have a lower taste for government than citizens in other cantons.

Excluding preferences, we find a strong negative correlation between direct democracy and canton expenditures or revenues just like in previous studies. Conditional on voter preferences, the coefficient on the institutional variable however declines by more than 40 percent. Omitting preferences therefore overstates the impact of institutions on policy outcomes. We also demonstrate that commonly used controls like the strength of left parties in canton parliaments do not solve the problem of omitted variable bias.

However, even after controlling for preference parameters, direct democracy decreases expenditures and revenues at the canton level by 8 percent. Access to direct democracy at the canton level also raises expenditures at the local level by more than 20 percent (see Matsusaka, 1995 for a similar result in the United States). The net effect of a mandatory budget referendum on combined expenditures at the canton and local level is zero. The main impact of a mandatory budget referendum is not to decrease overall spending, but decentralize expenditures!

Institutions matter even after controlling for voter preferences. We can reject a pure median voter model, in which institutional rules do not affect policies independently of voter

preferences. Both demand (voter preferences) and supply (institutional framework) matter for the size and scope of government.

This paper improves upon the previous literature on direct democracy and fiscal policy along three dimensions: we outline an empirical framework that clarifies what specifications commonly used in the literature identify. Further, we provide direct evidence on how preferences of voters differ across institutional regimes. Finally, we avoid the omitted variable bias that plagues previous estimates even in the absence of large-scale institutional change.

Our analysis also differs from previous studies that estimate voter preferences (Gerber and Lewis, 2004; Lewis, 2001; Snyder, 1996) in at least two ways: first, we focus on fiscal policy outcomes directly, while most of the literature studies legislator roll call votes. We believe that actual policy outcomes are of first-order interest for economists. In addition, data on roll call votes are not available in many countries or not informative if legislators' votes are determined by party discipline or related procedures.[6] Second, most studies assume that voter preferences differ along a single dimension. Our evidence suggests that this is a restrictive assumption. Voter preferences differ along multiple dimensions and in our case, it is the higher dimension that affects fiscal policy.

The paper proceeds as follows. The next section outlines our analytical framework and estimation strategy, while Section 3 provides background information on the structure of direct democracy and fiscal policy in Switzerland. Estimates of voter preferences are reported in Section 4, while Section 5 shows how institutional rules and voter preferences affect fiscal policy. Section 6 presents additional specifications tests to demonstrate the robustness of our results. Finally, Section 7 discusses the policy implications of our findings and concludes.

[6]For example, the study closest to ours exploits changes in voter preferences induced by redistricting to analyze shifts in roll call voting behavior (Glazer and Robbins, 1985). However, they do not provide direct evidence on how voter preferences changed after redistricting. Also, they use roll call votes as their outcome variable, whereas we study fiscal policy outcomes directly.

2 Analytical Framework

2.1 Voter Preferences, Institutions and Fiscal Policy Outcomes

Observed policies are the equilibrium outcome between demand for and the supply of government services. The demand for government is determined by voter preferences and electoral rules defining the constituency. The supply of government services in contrast is influenced by the rules governing the political process, for example whether citizens can directly shape policy through referendums or initiatives. We address each of them in turn.

To study the demand for government by voters, we use the characteristics model of Gorman (1980) and Lancaster (1966). The utility function of individual i is defined over a composite private good c_i and the policy characteristics X_l

$$U_i = c_i + \sum_{l=1}^{L} \alpha_l^i H_l(X_l)$$

where $\alpha_l^i > 0$ denotes an individual-specific taste parameter for characteristic X_l. We assume that H_l is increasing, quasi-concave and one-to-one for positive values of X_l. Note that this formulation assumes that the utility function is additively separable in the policy attributes.[7] This utility function simplifies to the original Meltzer and Richards (1981) model if X_l is a scalar and interpreted as a public good.

We assume that all voters have the same income, which we normalize to 1. Individuals differ only in their taste for the policy attributes. The budget constraint of the individual is

$$c_i = 1 - Y$$

where the right-hand side is available income net of public expenditures Y, which are used to

[7] It is straightforward to allow for nonseparability between attributes like for example $H(X_1, ..., X_L)$. In that case, the optimal level of one policy attribute would depend on the desired level of any other attribute.

finance the policy attributes. Finally, we assume that the government has to run a period-by-period balanced budget. The government budget constraint is then

$$Y = \sum_{l=1}^{L} p_l X_l$$

where p_l denotes the implicit price for a unit of the policy attribute, which we take as exogenously determined. We assume that all policy attributes are goods with a non-negative price, $p_l \geq 0$. Substituting for private consumption from the two budget constraints, we can rewrite the utility function as

$$U_i = 1 - \sum_{l=1}^{L} p_l X_l + \sum_{l=1}^{L} \alpha_l^i H_l(X_l)$$

Maximizing the utility function with respect to the policy attributes and assuming an interior solution yields the set of first-order conditions

$$\alpha_l^i \frac{\partial H_l}{\partial X_l} = p_l \qquad \forall l \tag{1}$$

The left-hand side is the marginal utility from an additional unit of the policy attribute X_l, while the right-hand side is the marginal cost. Solving for the desired level of the policy attribute by individual i gives

$$X_{il}^* = H_{Xl}^{-1}\left(\frac{p_l}{\alpha_l^i}\right) \tag{2}$$

where H_{Xl}^{-1} is the inverse of $\frac{\partial H_l}{\partial X_{il}}$. The demand for policy characteristics increases in the taste for the characteristic $\left(\frac{\partial X_{il}^*}{\partial \alpha_l^i} > 0\right)$ and decreases in its shadow price $\left(\frac{\partial X_{il}^*}{\partial p_l} < 0\right)$. The implied government expenditures desired by individual i is then $Y_i^* = \sum_{l=1}^{L} p_l X_{il}^*$.

To determine how voter preferences translate into actual policies, we need to analyze the supply side. If the median voter theorem holds, governments would simply choose the level

of characteristics desired by the median voter $X_l^{*Med} = H_{Xl}^{-1}\left(\frac{p_l}{\alpha_l^{Med}}\right)$ with implied spending

$$Y^{*Med} = \sum_{l=1}^{L} p_l X_l^{*Med} \tag{3}$$

This equation provides a link between desired spending and the demand for policy attributes with their implicit prices. Even if political institutions impose no constraint on the political process, cantons with strong direct democracy ($I = 1$) might have lower observed expenditures because their citizens desire less spending ($Y^*_{Med,I=1} < Y^*_{Med,I=0}$) for two reasons: because they have a lower taste for policy attributes ($\alpha_l^{Med(I=1)} \leq \alpha_l^{Med(I=0)}$ $\forall l$ with $\alpha_l^{Med(I=1)} < \alpha_l^{Med(I=0)}$ for at least one) or because cantons with strong direct democracy provide policy attributes at a lower price ($p_l^{I=1} \leq p_l^{I=0}$ $\forall l$ with $p_l^{I=1} < p_l^{I=0}$ for at least one).

Suppose now that political institutions of direct democracy affect the supply side, for example because governments cannot commit to policies prior to elections. Whether institutions like the budget referendum actually constrain the government depends crucially on the position of the median voter relative to that of the government (denoted by G^*) and the status quo in the policy space (see Gerber, 1996; Moser, 2000; Romer and Rosenthal, 1979a). The theoretical and empirical literature typically assumes that voters desire less spending than the government, so $G^* \geq Y^{*Med}$.

When direct democracy has an effect on policy proposals and there is perfect information about voter preferences, direct democracy brings actual policies Y_c closer in line with the preferences of the median voter. For a given Y_c^{*Med}, we thus have $\left|Y_c - Y_c^{*Med}\right|_{I=1} < \left|Y_c - Y_c^{*Med}\right|_{I=0}$ where $I = 1$ if the direct democratic instrument is in place and $I = 0$ otherwise.[8]

If desired spending by the median voter were observed in the data, we could simply

[8] Policies in a direct democracy could be further away from the preferences of the median voter than in a purely representative system if there are interest groups and incomplete information about voter preferences (Matsusaka and McCarty, 2001).

compare the difference between actual and desired expenditures across institutional regimes. However, desired spending is never observed in practice. The next section shows how we can use data on ballot propositions to learn about policies desired by the voters even if desired spending levels themselves are unobserved.

2.2 Estimation Approach

Suppose we have data on J proposed binary policy choices. Let the characteristics of supporting the proposition j be denoted by X_{1j} and those of the alternative status quo by X_{0j}. Each voter's preferences over X_{1j} and X_{0j} are characterized by a pair of utility functions U_{1i} for supporting the proposition and U_{0i} for supporting the status quo. We allow for random shocks to preferences that are voter- and ballot-specific, which are denoted by ε_{1j}^i and ε_{0j}^i respectively. Utilities over the two policy options are then defined as $U_1^i\left(X_{1j}, \varepsilon_{1j}^i\right)$ and $U_0^i\left(X_{0j}, \varepsilon_{0j}^i\right)$. Assuming that the conditional expectation exists, we can define the mean utility for the proposed policy as $V\left(X_{1j}\right) = E\left[U_1^i\left(X_{1j}, \varepsilon_{1ij}\right) \mid X_{1j}\right]$ and likewise for the status quo as $V\left(X_{0j}\right)$. Individual utility from the proposition can then be written as $U_1^i\left(X_{1i}, \varepsilon_{1j}^i\right) = V\left(X_{1j}\right) + \varepsilon_{1j}^i$ and similarly for $U_0^i\left(X_{0j}, \varepsilon_{0ij}\right)$. The probability that an individual voter i votes in favor of proposition j $\left(D_{ij} = 1\right)$ is then

$$P(D_{ij} = 1 \mid X_{1j}, X_{0j}) = P\left(V\left(X_{1j}\right) - V\left(X_{0j}\right) > \varepsilon_{0j}^i - \varepsilon_{1j}^i \mid X_{1j}, X_{0j}\right) \tag{4}$$

The voting behavior at the canton level follows by simple aggregation of the individual choices. The aggregate utility function U_{1j}^c can be written as

$$U_{1j}^c = f\left(U_{1j}^{i,c}\right)$$

where U_{1j}^{ic} is the preference of resident i in canton c and U_{0j}^c is defined in an analogous

fashion. In the direct democratic setting we use to estimate voter preferences, $f_{ct}(\bullet)$ picks the preferences of the median voter. Thus, $f = 1$ if $Pr(U_{1j}^{i,c} \leq U_{1j}^{Med,c}) \leq 0.5$ and $Pr(U_{1j}^{i,c} > U_{1j}^{Med,c}) > 0.5$ and zero otherwise, where $U_{1j}^{Med,c}$ denotes the preferences of the median voter for the proposition in canton c. Since the assumptions on the individual utility functions also apply to the median voter, we can write $U_{1j}^{Med,c} = V^{Med}(X_{1j}) + \varepsilon_{1j}^{Med}$ and $U_{0j}^{Med,c} = V^{Med}(X_{0j}) + \varepsilon_{0j}^{Med}$. Then, we know that a canton votes in favor of the proposition if

$$P(D_{cj} = 1) = P\left(V^{Med,c}(X_{1j}) - V^{Med,c}(X_{0j}) > \varepsilon_{0j}^{Med,c} - \varepsilon_{1j}^{Med,c}\right) \tag{5}$$

where the conditioning on X_{1j} and X_{0j} is kept implicit.[9] With data on canton-level yes or no votes in federal ballots, a functional form for $V^{Med,c}$ and a distributional assumption for $\left(\varepsilon_{1j}^{Med,c} - \varepsilon_{0j}^{Med,c}\right)$, estimation of (5) would be straightforward if (X_{1j}, X_{0j}) were observed. However, we do not observe the policy attributes of ballots propositions.

We use a linear factor model to estimate the preference parameters over the latent policy characteristics (X_{1j}, X_{0j}). The linear factor models has three main advantages over other estimation approaches. First, the linear setup maintains a rigorous link of preference parameters at the canton level and the underlying individual-level choice model. Second, the

[9] To illustrate how canton votes are related to the desired spending in (3), suppose a ballot that would increase expenditures ($Y_1 > Y_0$). Assume a standard spatial voting model, where voter preferences are one-dimensional and the mean utility function is quadratic: $V_1^{Med,c}\left(Y_{Med,c}^*, Y_1\right) = -\left(Y_1 - Y_{Med,c}^*\right)^2$ and $V_0^{Med,c}\left(Y_{Med,c}^*, Y_0\right) = -\left(Y_0 - Y_{Med,c}^*\right)^2$ where $Y_{Med,c}^*$ denotes the desired spending level of the median voter in canton c. A canton would then vote for the proposition $D_c = 1$ if

$$P(D_c = 1 \mid Y_1, Y_0, Y_{Med,c}^*) = P(-\left(Y_1 - Y_{Med,c}^*\right)^2 + \left(Y_0 - Y_{Med,c}^*\right)^2 > \varepsilon_0^{Med,c} - \varepsilon_1^{Med,c} \mid Y_1, Y_0, Y_i^*)$$

Simplifying yields that

$$P(D_c = 1 \mid Y_1, Y_0, Y_{Med,c}^*) = P\left(Y_{Med,c}^* > \frac{Y_0 + Y_1}{2} + \frac{\varepsilon_0^{Med,c} - \varepsilon_1^{Med,c}}{2(Y_1 - Y_0)}\right)$$

For given values of spending (Y_1, Y_0) and draws of the random errors $(\varepsilon_1^{Med,c}, \varepsilon_0^{Med,c})$, cantons, in which the median voter has a higher taste for government $Y_{Med,c}^*$, are more likely to support a ballot with higher proposed spending. Thus, voting behavior in propositions is informative about the relative size of the bliss point in different cantons, though we cannot estimate its precise location in the policy space.

setup allows policy preferences between voters to differ along several dimensions. Finally, under the assumptions of mutual orthonormality of the factors, we can consistently estimate preference parameters though not the underlying policy attributes.[10]

Using the singular decomposition theorem, the choice probabilities at the canton level in (5) can be written as

$$\Pr(D_{cj} = 1) = \sum_{l=1}^{L} \lambda'_{cl} F_{jl}$$

where $\lambda_{cl} = \left(\gamma_l^2 \overline{\lambda}_{cl}\right)$. γ_l^2 are the set of nonnegative eigenvalues and $\overline{\lambda}_{cl}$ the orthonormal chracteristics vectors of $\overline{P}\overline{P}'$ where $\overline{P} = \Pr(D_{cj} = 1 \mid X_{1j}, X_{0j})$ is the $(I \times J)$ matrix of choice probabilities at the canton level. F_{jl} are the orthonormal characteristics vectors of $\overline{P}'\overline{P}$ associated with the nonzero characteristics vectors and L the number of independent factors.

The factor model is a linear representation for any set of choice probabilities when characteristics of policies are unobserved (Heckman and Snyder, 1997). The linear factor structure also arises as an exact representation of the median voter's utility if the true mean utility function is linear in the policy characteristics (as for example in the directional voting model), and all policy attributes are mutually independent.

Imposing mutual orthonormality on the factors, such that factors are mutually independent and of unit length, we can identify the set of λ_{cl} for each canton. These identify the marginal valuations for the latent policy attributes by the median voter in each canton, which from (1) is equal to the implicit price of the policy attribute p_l in canton c. Our estimation strategy thus maintains a tight link to the parameters in the underlying choice model.[11]

[10] If voter preferences are linear, another nice feature of the linear factor structure is that $V^{Med}(X_{1j}) = \lambda^{Med,c} X_{1j}$, which is the intermediate preference specification commonly used in voting models. Models that are nonlinear in the attribute vector produce biased preference estimates because they inherit the incidental parameter problem of policy attributes. While random effects models can consistently estimate the preference parameters, they restrict voter preferences to differ along a single dimension (Londregan, 2000; Lewis, 2001; Gerber and Lewis, 2004).

[11] If the true underlying mean utility is linear as in the directional voting model and all characteristics

With estimates of λ_{cl} in hand, we can now address the question how direct democracy affects fiscal policy conditional on voter preferences. Fiscal policy outcomes in canton c denoted by Y_c can be written as

$$Y_c = g(Y_c^{Med*}(\lambda_c), I_c, Z_c) \tag{6}$$

where Y_c^{*Med} again denotes the policy outcomes desired by the median voter and λ_c is the vector of marginal valuations in canton c. I_c is an indicator whether a particular direct democratic institution is in place and Z_c are other characteristics that influence policy outcomes, for example economies of scale in the provision of public goods.

Previous studies have estimated the effect of political institutions like the voter intiative or access to referendums on fiscal policy without including voter preferences. If access to direct democracy is correlated with voter preferences, this derivative is

$$\frac{\partial Y_c}{\partial I_c}|_{Z_c=z_c} = \frac{\partial g}{\partial I_c}|_{Z_c=z_c} + \left(\frac{\partial g}{\partial Y_c^{*Med}} * \frac{\partial Y_c^{*Med}}{\partial I_c}\right)|_{Z_c=z_c}$$

If direct democracy constrains spending $\frac{\partial g}{\partial I_c} < 0$. However, if cantons with stronger direct democracy have a lower taste for government ($\frac{\partial Y_c^{*Med}}{\partial I_c} < 0$), the last term is negative. Previous studies then overestimate the constraining effect of institutions on fiscal policy outcomes.

Our first parameter of interest is therefore whether direct democratic instruments influence policy outcomes keeping voter preferences and other factors constant, or

$$\frac{\partial Y_c}{\partial I_c}|_{Y_c^{*Med}=y_c, Z_c=z_c} = \frac{\partial g}{\partial I_c}|_{Y_c^{*Med}=y_c, Z_c=z_c} \tag{7}$$

If access to direct democracy restrains government conditional on preferences, $\frac{\partial g}{\partial I_c} < 0$. In

are mutually independent, the recovered vector of preference parameters λ_{cl} identify the bliss points of the median voter in canton c over the characteristics X_{1l}^c.

the empirical analysis however, we cannot condition on Y_c^{*Med}, but only on its estimable component λ_{cl}. If there are factors other than the implicit price that shift desired X_c^{*Med}, the coefficient on the institutional variable could still be biased.

Since $Y^{*Med} = \sum_{l=1}^{L} p_l X_l^{*Med}$ (from (3)), the derivative of observed spending with respect to the observable component of voter preferences, $\frac{\partial g}{\partial Y_c^{*Med}} \frac{\partial Y_c^{*Med}}{\partial \lambda_{cl}} = \frac{\partial g}{\partial Y_c^{*Med}} X_l^{*Med}$, identifies the unobserved desired policy attribute X_{cl}^{*Med} up to a constant. If cantons with stronger direct democracy have a lower taste for government, X_{cl} represents an attribute that raises expenditures and $\frac{\partial g}{\partial Y_c^{*Med}}$ is independent of the direct democratic regime, we expect this derivative to be smaller in cantons with strong direct democracy. Thus,

$$\frac{\partial g}{\partial Y_c^{*Med}} X_{cl}^{*Med}|_{Z_c=z_c, I_c=1} \leq \frac{\partial g}{\partial Y_c^{*Med}} X_{cl}^{*Med}|_{Z_c=z, I_c=0} \tag{8}$$

Including an interaction term between voter preferences and institutional regime thus controls for the unobserved component of desired spending, X_{cl}^{*Med}. The coefficient on the main institutional effect then provides an estimate of the constraining effect of direct democratic institutions on fiscla policy that controls for preference heterogeneity due to both differences in the marginal valuation (λ_{cl}) and desired spending levels (X_{cl}^{*Med}).

3 Institutional Background

3.1 Fiscal Policy and Direct Democracy in Switzerland

The government sector in Switzerland is with 34 percent of GDP (1996) comparatively small, far below the average in the European Union. Switzerland has a strong federalism where all political responsibilities remain at the canton level unless they were granted to the federal government in a national referendum. In 1998, 40 percent of all government spending was undertaken by cantons, only 33 percent by the federal and 27 percent by local governments.

Cantons have a lot of autonomy in the provision of public goods and the redistribution of wealth. They spend 50 percent of all education, 60 percent of health and around 27 percent of social welfare expenditures. These three categories account for almost 60 percent of the cantonal budget. The distribution of revenues across government levels is equally decentralized. Cantons have the authority to tax labor and capital income, which account for roughly 50 percent of cantonal and local revenues. As a consequence, there is substantial variation in the tax burden across cantons.[12]

Direct democracy has always played a dominant role in Swiss politics. The mandatory referendum and voter initiative to change the constitution have been in place since the Confederation was founded in 1848. Political participation rights for citizens in the different cantons are even older. By 1831, the initiative to propose new laws was in place in Thurgau, Aargau and Schaffhausen and the referendum on new laws in St. Gallen. In cantons with a town meeting, direct participation goes back even further to the 13th and 14th century.[13]

Direct democracy is stronger in German-speaking parts of Switzerland, which includes some of the large urban centers like Basle, Zurich or Berne (see Figure 1 for a map of the 26 Swiss cantons). Citizens can propose new laws through the voter initiative, approve existing laws in a law referendum and vote on large projects proposed by the canton government in a budget referendum.[14]

In the empirical analysis below, we will focus on the budget referendum as it provides

[12]For example, the tax burden in 2000 varied from 126.7 in Neuchatel to 58.2 in Zug with the average is normalized to 100. The federal government in contrast mainly relies on sales and consumption taxes. There is also a highly progressive federal income tax with a maximum marginal rate of 13.2 percent and an average rate of 11.5 percent.

[13]The law referendum at the federal level was introduced in 1874 and the initiative to partially change or amend the constitution in 1891. Because of the long direct democratic tradition in Switzerland, learning effects about voting rights and procedures are of minor concern - in contrast to other countries that recently introduced or strengthened direct democratic participation.

[14]In 2000, 8 out of the 26 cantons allow for a mandatory law referendum that requires all new canton laws to be approved by its citizens. While all cantons allow for the voter initiative, the signature requirements vary from 1 to 15,000, lower than in the United States. Initiatives are most intensely used in urban centers like Basel, Bern, Geneva or Zurich. For example, voters in the canton Zurich decided on more than 1100 propositions between 1848 and 1996. Their success rates range from 0 percent in Schwyz or Fribourg to 50 percent in Waadt or Basle City.

the most direct influence on fiscal policy.[15] 23 of the 26 cantons have some form of budget referendum.[16] In 2000, 15 cantons had a mandatory budget referendum in place, which requires citizens to vote on a project that exceeds a certain threshold. Ten cantons only allow for an optional budget referendum, while the canton Vaud does not provide for any type of budget referendum. For an optional referendum, citizens need to collect between 100 and 10,000 signatures to initiate a vote on a project above the threshold.[17]

Control over the budget is stronger in cantons with mandatory budget referendum, since voter approval is mandated by law. We thus define a canton as more direct democratic with respect to fiscal policy, if it has a mandatory budget referendum in place. In contrast, cantons with no or only an optional budget referendum are classified as having a weaker form of direct democracy.[18] Between 1950 and 2000, four cantons switched from mandatory to an optional referendum (Aargau in 1982, Bern in 1995, Obwalden in 1998 and Zurich in 1999), while three cantons in contrast introduced the mandatory referendum (Appenzell-Innerrhoden in 1979, Fribourg in 1986 and Lucerne in 1969). We study cantons switching from one institution to another in more detail in the robustness section.

Figure 2 shows the evolution of cantonal expenditures per capita for cantons with mandatory budget referendum and those without. To control for growing government expenditures

[15] Budget referenda are similar to Proposition 13 in California or budget approvals for local school districts in the US. While budget referendums in Switzerland can be about expenditures, public-sector bonds, taxes, enterprise holdings and real estate, we restrict attention to referendums on public expenditures, which are by far the most common. Between 1980 and 1999, citizens in the 26 cantons voted on 461 budget referendums and approved 86 percent of the projects (Trechsel and Serduelt, 1999).

[16] The canton Vaud has no budget referendum at all, while budget referendums in Wallis and Fribourg are restricted to extraordinary expenditures.

[17] Budget referendums are on single projects only, not the canton budget. It applies to both recurring and non-recurring expenditures with the thresholds for recurring expenditures being around one-tenth of those for non-recurring expenditures. Thresholds for non-recurring expenditures range between 25 Million Swiss Francs (SFr) in Lucerne and 250000 SFr in Schwyz (1999). This implies that a project of on average 6.8 million SFr or just less than 1 percent of average expenditures mandates a referendum. For recurring expenditures, thresholds are between 50000 (Appenzell-Innerrhoden, Basel-Land, Nidwalden, Ticino and Uri) and 400000 SFr (Berne).

[18] Several cantons allow for both a mandatory and optional budget referendum: Zurich, Lucerne, Uri, Obwalden, Nidwalden, Fribourg, Solothurn, Schaffhausen, Appenzell-Innerrhoden, St. Gallen, Graubuenden, Thurgau and Jura.

over time, we first regressed log per capita expenditures on a common linear trend. The figure plots the deviation of each canton from this linear trend. Cantons with stronger direct democracy have lower expenditures than those with a weaker form throughout the whole sample period. Also, the gap between cantons with and without mandatory budget referendum appears to have widened since the 1970s.

3.2 Canton-Level Panel Data

We collected a comprehensive dataset on fiscal policy, political institutions and other characteristics of each canton from 1950 to 2000.[19] Table 2 shows summary statistics separately for cantons with a mandatory budget referendum and those with only an optional or no budget referendum over the whole period. In cantons with a mandatory budget referendum, expenditures are lower at the canton level, but higher at the local level. A similar picture emerges for canton revenues: they are lower in cantons with mandatory budget referendum with the exception of revenues collected at the local level. Finally, cantons with a mandatory budget referendum run around half the budget deficit per capita.

The two types of cantons also differ in their political system and usage of direct citizen participation. Cantons with a mandatory budget referendum have a smaller number of parties relative to the number of seats in canton parliaments (as measured by the fractionalization) and a 5 percent lower share held by left parties. They also have easier access to other instruments of direct democratic participation: they are more likely to have a law referendum and a lower signature requirement for the voter initiative, which is allowed in all cantons. Citizens in cantons with mandatory budget referendum vote on more cantonal propositions per year and have higher voter turnout.

Finally, the cantons with and without mandatory budget referendum also differ in their demographic, social and economic structure. Cantons with a mandatory budget referendum

[19] See Appendix A for a more detailed description of the data sources and variables.

have a much higher fraction of rural population and lower population density. Their residents are less likely to be Catholic, divorced or single parents. Unemployment rates, annual income and the percentage of the population with a university degree are lower in cantons with mandatory budget referendum. Since cantons with and without mandatory budget referendum are very heterogeneous in their observable characteristics, we would expect them to have different tastes for government spending.

4 Evidence on Voter Preferences

4.1 Data on Federal Ballots

To analyze the demand for government, we exploit the fact that Switzerland has wide-ranging provisions for direct democratic participation also at the federal level. Citizens can initiate a partial or total revision of the federal constitution, which allows for a wide variety of policy proposals.[20] In addition, changes of the federal constitution and international treaties proposed by the government need to be approved by voters in a mandatory referendum. Finally, all federal laws and executive orders are subject to an optional referendum if 50,000 signatures are collected within 100 days of the document's publication.

We collected data from all 335 federal ballots between 1950 and 2000.[21] The data contains the date, title and type of ballot, whether the canton approved the propositions as well as the percentage of yes votes in each canton. The dataset has several unique features: first, we can estimate political preferences from information revealed in actual votes on propositions with real fiscal consequences. We consider that a more reliable source of voter preferred policies than opinion polls commonly used in the literature.

[20] For federal initiatives, citizens have to collect 100,000 signatures within 18 months of the text's publication. The parliament can propose a counter-initiative, which is then also put on the ballot. Since 1987, people vote on the initiative and the counter-initiative simultaneously. On average, there is a 2 1/2 years lag between the submission of an initiative and the voting date.

[21] The data are available online at http://www.admin.ch/ch/d/pore/va/liste.html.

Second, the federal ballots cover a broad range of topics from the introduction of fuel taxes, government finances, environmental protection, membership in international organizations, education and health policy. This ensures that the propositions span all relevant dimensions of the policy space.[22] Finally, our estimated preferences are easily comparable as citizens in all cantons vote on the same proposition.

A first look at voting patterns across cantons suggests that voters in cantons with mandatory budget referendum are genrally less supportive of government spending. For example, support for an increase in the salary of federal policy makers in 1992 was 30.9 percent in cantons without mandatory budget referendum, but only 23 percent in cantons with (T-statistic: 2.68). Similarly, a ballot in 1998 to invest in public transport was approved by 66.9 percent of the voters in cantons without and 56.8 percent of voters in cantons with mandatory budget referendum (T-statistic: 2.83). We now turn to a more systematic investigation of the taste differences for government across institutional regimes.

4.2 Estimates of Voter Preferences

This section uses the econometric framework outlined in Section 2 and the yes or no vote by canton and proposition to estimate preferences at the canton level. We allow voter preferences to shift over time by estimating factor loadings separately for each decade. To make estimates comparable, we supplement the canton votes with the voting recommendations of political associations.[23] Table A1 in the appendix reports the basic estimation results. The first

[22] Federal and cantonal governments share responsibilities in policy areas like taxes, subsidies to agriculture or civil and criminal law. Cantons in contrast are solely responsible for police, churches and education below the tertiary level, while the federal government deals with international relations, defense, customs and currency, atomic energy, media, postal service, tertiary education, telecommunication as well railways and air traffic. For social security, roads, environmental policy and industrial and labor regulation, the federal government provides the legal basis, while cantons are responsible for its execution. This ensures that voting behavior in federal propositions will provide a good proxy for policy preferences at the canton level.

[23] The basic assumption is that lobby groups have stable preferences that are largely determined by their own political ideology. In the empirical analysis, we used the recommendations of Evangelical Party. It is a small political party, but had more voting recommendations than other lobby groups. We also experimented with unions' recommendations, which yielded very similar results.

three factors have eigenvalues above one and account for more than 80 percent of the overall variance. The variance explained by additional factors is small.

Recall that the factor loadings identify for each canton the median voter's valuation of the latent policy attributes characterizing federal propositions. To facilitate interpretation of these latent attributes, we regress the factor loadings on social and economic characteristics of cantons. The results shown in the top panel of Table 3 are pooled across decades and standard errors are corrected for clustering at the canton level. Preferences for the first attribute increase with average cantonal income and decrease with the share of young or divorced people as well as the fraction of catholics in the population.

For the second dimension, loadings are higher in the French- and Italian-speaking cantons and positively correlated with the share of left parties in the parliament. Preferences for this attribute increase in the fraction of young people and the unemployment rate, but decreases with mean income. Loadings on the third factor are higher in predominantly French- or Italian-speaking cantons and lower in cantons with a high share of the population at working-age. While the factor loadings are clearly correlated with canton characteristics, the R^2 in the last row shows that there is substantial variation left in the parameters even after controlling for many canton characteristics.[24]

The bottom part of Table 3 shows how the factor loadings are correlated with the direct democratic instruments. Cantons with a mandatory budget or law referendum and those with a lower signature requirement for the initiative tend to have higher loadings on the first factor and lower ones on the second factor. In contrast, there is no statistically significant correlation between the third dimension and the direct democratic instruments.

As an alternative way to interpret the factor loadings, we included the voting recommendations of the conservative ("Christlichdemokratische Volkspartei der Schweiz") and social democratic party ("Sozialdemokratische Partei der Schweiz") in the analysis. Along the first

[24]See Gerber and Lewis (2004) for a similar result on Californian data.

dimension, the estimated loadings for the Conservatives were much higher than for the Social Democrats. In contrast, valuations along the second and third dimension were higher for the Social Democrats than the Conservatives. This suggests that the first factor represents a conservative-liberal dimension with high loadings associated with a more conservative attitude. High loadings along the second and third factor in contrast are associated with an attitude more favorable to redistribution (Factor 2) or state regulation (Factor 3).[25]

To see how voter preferences differ between cantons with different direct democratic regimes and over time, Figure 3 plots the mean factor loadings of the first and second dimension as well as pointwise 95 percent confidence intervals separately by institutional regime. Three facts are noteworthy: voters in canton without mandatory budget referendum have a less conservative attitude and a larger taste for government. The differences in mean preferences between the two groups of cantons is statistically significant over the whole period with a T-statistic of -3.8 and 4.2 respectively. Second, the width of the pointwise confidence intervals show that there is substantial variation in voter preferences, especially in the group without mandatory budget referendum. Finally, our estimated voter preferences are relatively stable over time.[26]

With the estimates of voter preferences in hand, we can now turn to the question whether political institutions of direct democracy shape fiscal policy conditional on the documented differences in voter preferences.

[25] A third way to interpret the factors is to look at the factor scores. Though not consistently estimated, they represent the importance of each policy dimension in a given proposition. The first factor has high scores on ballots about home construction, trade of weapons, extension of the franchise to 18-20 years-old, a new federal constitution and public goods like speed limits on highways, cultural activities. Factor scores for the second dimension are high for the constitutional reform of federal finances, financial support for agriculture and technical universities or the reform of customs. Finally, propositions with high scores on the third dimension largely deal with regulatory issues in areas like education, construction, public transport or the military.

[26] While loadings for the second factor decrease slightly for cantons with and increase for cantons without mandatory budget referendum and loadings of the first factor go down most notably in the 1980s when environmental issues were high on the political agenda. However, neither changes are statistically significant. There are no statistically significant differences across cantons in preferences along the third dimension, which is also uncorrelated with fiscal policy issues.

5 Preferences, Direct Democracy and Fiscal Policy

5.1 Preferences Matter

We match the estimated preference parameters to the panel of fiscal policy outcomes, political institutions and canton characteristics. All variables are decade means for the 25 cantons.[27] To assess how direct democracy and voter preferences shape fiscal policy, we use the following specification

$$Y_{ct}^{P} = \alpha + \beta I_{ct} + \gamma \widehat{\lambda_{ct}} + \delta Z_{ct} + \varepsilon_{ct} \tag{9}$$

where Y_{ct}^{P} denotes the fiscal policy measure like expenditures or revenues in canton c and decade t, $\widehat{\lambda_{ct}}$ denotes our estimated voter preferences and I_{ct} is one if canton c has a mandatory budget referendum in place in decade t and zero otherwise. Z_{ct} contains decade dummies and other observable variables that affect the demand or supply of government activity.

While three separate dimensions were required to account for voting behavior in federal ballots, we only require one to characterize voter preferences with respect to fiscal policy. While the first and second dimension are highly correlated (correlation coefficient: -0.67), the third factor is uncorrelated with other factors and expenditures. The estimates reported here are based on a specification, which includes voter preferences along the redistributive, second dimension.[28]

The results are shown in Table 4 where the dependent variables are the log per capita canton expenditures (top panel) and log canton revenues (bottom panel).[29] Standard errors

[27] We excluded the canton Jura that was founded in 1977. With respect to cantons switching between mandatory and optional referendum, we assigned them the institutional regime they had in place over most of the decade. We dropped one observation where the canton switch in the middle of the decade (Berne in 1995).

[28] Preferences along the conservative dimension (Factor 1) are negatively, those along the redistributive dimension (Factor 2) positively correlated with spending. None of the omitted factors were significant in the regressions. In addition, estimates from a specification with three or four factors were very similar to the ones reported here and are available from the authors upon request.

[29] There are several reasons why we choose the log specification: first, cantonal expenditures are log normally distributed. Also, spending 1000 SFr more weighs more if the overall budget is smaller. Finally, the log specification allows a simple interpretation of the coefficient on the institutional variable. The results

are bootstrapped to account for the fact that we use estimated preference parameters $\widehat{\lambda_{ct}}$ instead of the true values. The first column includes only the institutional variable and decade dummies, so $\gamma = \delta = 0$. The estimate implies that cantons with a mandatory budget referendum have 23.6 percent or about 1230 SFr lower per capita expenditures than those without, a result similar to previous findings on Swiss data.

If preferences affect fiscal policy and differ across institutional regimes as shown above, the coefficient β will be downward biased and thus exaggerate the restraining effect of the political institution on government spending. In column (2), we add voter preferences. Increasing the taste for government by one standard deviation or 0.3 is associated with a 13.4 percent or 680 SFr higher expenditures per capita. In contrast, the coefficient on the direct democracy variable declines by more than 10 percentage points to 14.4 percent. In column (3), we add variables to control for other factors influencing government spending, but exclude voter preferences ($\gamma = 0$). The coefficient on the direct democracy instrument declines to 13.9 percent as would be expected if the controls pick up some of the preference variation across cantons.

In column (4), we again add our voter preference estimates. As before, a higher taste for government is associated with more government spending. More surprisingly, having a mandatory budget referendum still decreases expenditures. Even after accounting for preference heterogeneity, cantons with a mandatory budget referendum have 10.8 percent or about 550 SFr lower expenditures than cantons without. While the coefficient on the institutional variable declined by 26 percent or 0.036 percentage points relative to the case where voter preferences are omitted, the effect is still substantial.

The results for log canton revenues are very similar: without including preferences, a mandatory budget referendum decreases revenues by 12.4 percent (column (3)). Including

with expenditure levels as the left-hand side variable were qualitatively very similar and are available upon request.

voter preferences, brings the coefficient on the budget referendum down by 30 percent to 8.7 percent.[30] The coefficients on the control variables have largely the expected sign. Federal aid per capita and unemployment rates are associated with higher expenditures. In contrast, neither population density nor the share of older people in the population has a statistically significant effect.

This suggests that the correlation between direct democratic instrument and fiscal policy outcomes alone says little about the restraining effect of institutions on the supply of government. Since differences in political institutions are associated with heterogeneity in preferences for government, the coefficient on the institutional variable picks up a combination of heterogeneity on the demand side and the effect of institutions on the supply side. Nevertheless, direct democratic instruments constrains fiscal policy even accounting for differences in the demand for government.

5.2 Testing Additional Implications

The evidence in the last section speaks against a pure median voter model, in which institutions have no influence on policy outcomes conditional on preferences. However, the coefficient on the institutional variable could still be biased upward since we conditioned on λ_c, but not the desired spending level by voters. As shown in (8) of Section 2, adding an interaction effect between voter preferences and the institutional indicator alleviates this problem. The interaction effect in the model is a function of the desired policy attributes X_l^{*Med}. If cantons with a mandatory budget referendum have a lower taste for government, we expect the interaction effect to be negative. Also, the coefficient on the institutional variable then identifies the constraining effect on the supply side net of preference heterogeneity

[30] If we used the log canton deficit as our dependent variable excluding all observations with a balanced budget or a surplus, we also find a strong negative effect of the mandatory budget referendum and little change conditional on preferences. Estimated in levels with all observations, the effect of mandatory budget is no longer signficant from zero once we include voter preferences.

in λ_c and X_l^{*Med}. The specification we estimate is

$$Y_{ct}^P = \widetilde{\alpha} + \widetilde{\beta}_1 \widehat{\lambda_{ct}} + \widetilde{\beta}_2 I_c + \widetilde{\beta}_3 \widehat{\lambda_{ct}} * I_c + \widetilde{\delta} Z_{ct} + \widetilde{\varepsilon}_{ct}$$

Our parameters of interest are now $\widetilde{\beta}_2$, which should be smaller than in the last section, and $\widetilde{\beta}_3$, which we expect to be negative. All other variables are as defined as before.

The results are reported in Table 5 for log canton expenditures (column (1)-(4)) and log canton revenues (column (5)-(8)). As expected the interaction effect is negative and significant. From our model, this implies that cantons with a mandatory budget referendum have a lower demand for government goods and services. While increasing the demand for government by one standard deviation or 0.3 increases expenditures by 20 percent in cantons without a mandatory budget referendum, the effect is only 8 percent in cantons with mandatory budget referendum.[31]

The coefficient on the institutional further declines by 2.1 percentage points or an additional 20 percent. Conditional on this broader set of controls for voter preferences, having a mandatory budget referendum decreases expenditures by 8.1 percent or 420 SFr. The effect is now only one third of the raw correlation between mandatory budget referendum and log expenditures (see column (1) in Table 4).

In column (2) and (3), we report switching regression results that allow the coefficients on all variables to vary by institutional regime. The same conclusion emerges: cantons with a mandatory budget referendum (column (2)) have a lower coefficient on voter preferences and thus a lower demand for policy attributes than cantons without (column (3)). The interaction term could just pick up a nonlinear effect of voter preferences on fiscal policy. To test this,

[31] We also experimented with a fixed effects estimator and first differences to eliminate any remaining time-invariant heterogeneity across cantons. While the effect of voter preferences remains significant though weaker, the interaction effect was never significant. The interaction effect is thus driven by cross-sectional variation. There is also the concern that measurement error in voter preferences might bias the results for the within estimator and first differences, which is why we do not report them here.

we estimated a linear spline, which allows the effect for small values of voter preferences to differ from high values. The results in column (4) shows that the relationship between preferences and expenditures is much higher at lower values for the demand for government and not statistically significant at high values. Therefore, nonlinearity alone cannot explain the differential effect of preferences on fiscal policy across institutional regimes.

Columns (5)-(8) tell a very similar story for log canton revenues. Conditional on the broader set of preferences, the institutional variable has no statistically significant effect on revenues. As before, cantons with a mandatory budget referendum have a lower demand for government goods and services as shown by the negative interaction effect and the statistically different coefficients in the switching regressions (column (6) and (7)). Like for expenditures, preferences have a much larger coefficient for low values, while there are not statistically significant at high values (column (8)).

5.3 Substitution across Levels of Government

The evidence thus far focused on expenditures and revenues at the canton level. Evidence from the United States (Matsusaka, 1995) suggests that the voter initiative has decentralized spending towards lower levels of government. Do we see a similar effect of the budget referendum in Switzerland? Column (1)-(3) of Table 6 report how institutions and voter preferences at the canton level affect log local expenditures (top panel) and log tax revenues (bottom panel)[32] The specifications and control variables included are same as in Table 4. All standard errors are again bootstrapped to account for estimation of voter preferences.

Column (1) shows the benchmark specification with the institutional variable and decade dummies only: having a mandatory budget referendum at the canton level is associated with 30 percent higher expenditures, but 43 percent lower tax revenues at the local level. The

[32] We have complete data on local tax revenues, but not overall revenues, which also include user fees. We can therefore not infer how the mandatory budget referendum affects budget deficits at the local level.

second column adds the other controls except for voter preferences. The correlation between mandatory budget referendum and expenditures or revenues becomes weaker, but remains highly statistically significant.

Finally, column (3) adds voter preferences. Conditional on voter preferences, the correlation between mandatory budget referendum and log local expenditures is now actually higher. Omitting voter preferences thus leads to a downward bias in the coefficient on the institutional variable. For tax revenues at the local level, adding voter preferences reduces the negative effect of mandatory budget referendum.

Does a mandatory budget referendum then just decentralize expenditures with no net effect on the combined size of government? To address this question, we estimated the same specification as before, where the dependent variable is now log expenditure or log tax revenues at the local and cantonal level. The estimates show that once we control for voter preferences, having a mandatory budget referendum has no statistically significant constraining effect on either combined expenditures or tax revenues. Note that this result is contrary to Matsusaka (1995), who found significant negative effects on combined spending in the United States. One potential explanation could be that he could not adequately control for preference heterogeneity.

This surprising result could be driven by two factors: first, politicians at the local level are able to increase spending when expenditures are constrained at the canton level. The plausibility of this explanation depends on the correlation between fiscal constraints at the local and canton level. In the absence of data to address this question, we leave it for future research. An alternative explanation is that citizens in cantons with mandatory budget referendum might actually prefer higher expenditures at the local level than other cantons. This would suggest that preferences for government are not independent of the level of government, an issue we address below.

6 Robustness Analysis

6.1 Additional Control Variables

Our basic specifications reported in the last section were very parsimonious due to the limited number of observations. This and the next section report several sensitivity checks that demonstrate the robustness of our results to the inclusion of additional variables and alternative specifications. Table 7 reports results for log canton expenditures with additional controls that could be correlated with expenditures. All specifications contain decade dummies and the same controls as in Table 4. Odd columns only contain the indicator for a mandatory budget referendum, while even columns add our estimate of voter preferences.

The first two columns also include the share of divorcees and of single parent households in the canton as well as the fraction of catholics and university graduates in the population. Only the share of divorced people above 20 has a statistically significant positive effect on expenditures (not reported). Even controlling for these variables, the coefficient on the institutional variable declines with voter preferences (column (2)). As there are large differences between German-speaking and other cantons, the next two columns add an indicator whether the majority in a canton is German-speaking. Conditional on the language, voter preferences have a stronger effect on expenditures and there is little change on the coefficient of the mandatory budget referendum. This suggest that most of the preference variation occurs between cantons speaking different languages.

In column (5) and (6), we add mean canton income to the specification, but exclude the additional variables from column (3) and (4). This specification is estimated for 1960-1990 only, since the income variable is missing in the 1950s. Again, we see a familiar pattern: the restraining effect of the institution declines by around 25 percent once we control for voter preferences.

Columns (7) and (8) include two proxies commonly used in previous studies to control

for taste heterogeneity across cantons: the percentage of left-party seats in the cantonal parliament and fractionalization measured as the number of parties relative to the number of parliament seats. Fractionalization has a statistically significant positive effect on expenditures, which might reflect the greater influence of interest groups. In contrast, the percentage of left-party seats is not statistically significant in any specification we estimate.[33] The same result has been found by Feld and Matsusaka (2003) for Switzerland and Matsusaka (1995) for the United States using Nominate scores of US senators.

Our preference variable continues to have a strong effect on expenditures and we see the familiar decline in the institutional variable (column (8)). This suggests that controls for voter ideology commonly employed in the literature do not capture preference heterogeneity with respect to fiscal policy. This conclusion is also supported by our earlier finding that canton characteristics and percentage left or fractionalization do not fully explain voter preferences (see Table 3).

6.2 Alternative Specifications of Direct Democracy

Economic theory provides little guidance on the specification for estimating the effect of political institutions on fiscal policy. Table 8 reports several alternative specifications of direct democracy. The results are shown for log canton expenditures and include the same controls as in Table 4.

The first two columns add other instruments of direct democracy to our set of controls: whether a canton has a mandatory law referendum in place as well as the signature requirement to launch a voter initiative. Neither variable has a statistically significant effect on expenditures (not reported) conditional on the mandatory budget referendum. While the

[33] Including these two variables excludes the cantons Obwalden until the 1990s as well as Appenzell-Innerrhoden and Appenzell-Ausserrhoden over the whole period because they these cantons do not have a canton parliament. To see whether it is the omitted cantons that drive the result, we reestimate the baseline specification from Table 4 on the subsample of cantons with a parliament. The results show that the result is not driven by composition changes.

restraining effect of the budget referendum is overall stronger, the coefficient still declines with the inclusion of preferences (column (2)).

Some cantons with a mandatory budget referendum also allow for an optional referendum. To see whether this affects our results, columns (3) and (4) allow the coefficient on the mandatory budget referendum to differ between cantons that also have an optional one and those that do not. Interestingly, the constraining effect of a mandatory budget referendum on expenditures is not present in cantons that also allow for the optional referendum. The effect of voter preferences is however unchanged.[34]

Seven cantons changed from a mandatory budget referendum to only an optional one or vice versa over the sample period. To ensure that our results are not driven by regime switchers, column (5) and (6) drop the kanton-year observations, in which a canton switches from a mandatory budget referendum to an optional one or vice versa. Dropping these observations does not affect the coefficients on the institutional variable or voter preferences.[35]

Political institutions could themselves be shaped by voter preferences, in which case our estimates.of voter preferences would be a lower bound of the full effect of voter preferences on fiscal policy outcomes. To address this question, we estimated a reduced-form model of expenditures on preferences and other controls (column (7) and (8)). As before, voter preferences are strongly positively correlated with fiscal policy. The second column adds whether the canton has a mandatory law referendum in place and the signature requirement for the voter intiative measured as a fraction of the population above 20. Comparing the reduced-form effect of voter preferences to the specification with both voter preferences and

[34] One explanation could be that thresholds for a mandatory referendum are only about one-third of those in cantons that also allow for an optional one. However, when we used expenditure thresholds in percentage of canton expenditure as our institutional variable, its coefficient was never significant and often had the wrong sign.

[35] We do not see shifts in factor loadings or breaks in canton expenditures before or after the shifts between mandatory and optional budget referendum or vice versa. Cantons that abandon the mandatory budget referendum have however a higher demand for redistribution than those that keep it. Likewise, cantons that adopt the mandatory budget referendum have a lower taste for redistribution than those that do not.

the institutional variable (Table 4) shows that the effect of voter preferences on fiscal policy works primarily through the demand for government.

6.3 Voter Preferences and the Level of Government

Our analysis employs voting behavior in federal propositions to estimate voter preferences for canton fiscal policy. Though commonly used in the literature, this approach relies on the potentially strong assumption that voter preferences are independent of the level of government.[36] This assumption would for example be violated if voters dislike spending at the federal level, but support it at sub-federal levels.

Unlike previous studies, we can address this question empirically. For the period 1970 to 1996, we have the results of 3064 canton-level propositions for the 21 cantons that do not hold town meetings. We can therefore compare voting outcomes on cantonal and federal propositions that address similar fiscal policy questions. The results for six sets of propositions in four different cantons are shown in Table 9.

The support for subsidies to public transport, cultural activities and education show a high dregree of consistency in voting behavior across levels of government. There is much higher support for home construction subsidies in the cantonal ballot by Berne. The difference could in part by driven by changes in preferences over time since the ballots are more than 20 years apart.

Another persistent difference in voting behavior occurs in voter support for a tax on wealthy households. Support for redistributive taxation is much higher at the national level than at the canton level both in Aargau and Basle City. Since it is more difficult to sustain redistribution at a sub-national level if households are geographically mobile, the result is in accordance with economic theory.[37] This should not systematically bias our estimates

[36] For example, Glazer and Robbins (1985) use voting behavior in presidential elections to proxy policy preferences at the state level.

[37] A second explanation for the divergenve in support in the same canton could be selection bias of voters. If

however, since the same gap appears in cantons with and without a mandatory budget referendum. The next section provides further evidence that our preference estimates are indeed informative about desired spending at the canton level.

6.4 Alternative Measure of Voter Preferences

Our estimates of voter preferences use the median voter model and all federal ballots irrespective of their fiscal policy relevance. An alternative measure of preferences is to use voter support in federal ballots that would have increased spending. This exploits the actual intensity of voter support, information not used in the estimation of the factor loadings. In addition, this alternative measure does not impose the restriction that only the median voter matters.

To assess the financial consequences of a ballot, we used the official documents prepared by the government, which are distributed to each citizen before the vote.[38] Overall, we could identify 32 such ballots between 1979 and 2000 (see Table A2 for a list of these propositions). The average support for higher government spending was 41.7 percent with a standard deviation of 19.5. It is on average 46.1 percent in cantons without mandatory budget referendum, but only 39.4 percent in cantons with one. The difference is statistically significant with a T-statistic of 4.6.

Table 10 reports the least-squares results where the dependent variable is again log expenditures per capita at the canton level in a given year. The control variables are the same as in the last section though they are now measured at annual frequency. The first two columns

voters of a canton participated in one ballot but not the other and have very different preferences for a wealth tax than those voting in both, this could also explain the results. Turnout for the ballots is higher (lower) at the federal level in Aargau (Basle City). This reversed turnout pattern does suggest that differential participation bias across ballots is not the driving force. A final explanation is measurement error since the propositions are not exactly the same.

[38] These documents (available at http://www.ads.bar.admin.ch/ADS/showHome.do) contain the arguments for and against a proposition, an overview of the parliamentary debate (if any) and outside opinions by interest groups. Most importantly for our purposes, it also outlines the financial consequences in terms of new expenditures or increases in taxes or subsidies.

only contain the preference variable, year dummies and the control variables. Column (2) reports results from fixed effects estimation that exploits variation within cantons over time for identification. Preferences have a positive and highly significant effect on cantonal spending. Raising support for additional government spending by 10 percent is associated with 24.9 percent larger canton expenditures. Exploiting only within-canton variation, a ten percent increase in voter support still raises canton expenditures by 4.6 percent.

Column (3) include the institutional variable and year dummies. Having a mandatory budget referendum is associated with 24.2 percent lower expenditures, an estimate very similar to the one reported in Table 4. Adding control variables (column (4)) brings this estimate down to 21.5 percent, a decline of just about 11 percent. Adding our measure of voter preferences reduces the constraining effect of having a mandatory budget referendum by 20 percent, very similar to our results based on the factor loadings.

Both factor loadings and voter support for more government spending tell a very similar story. Without adequately accounting for voter preferences, coefficients on political institutions estimate the joint effect of the political institution and the preferences of citizens within their jurisdiction. Even after controlling for preferences however, political institutions constrain government spending.

7 Conclusion

This paper outlines an empirical strategy to analyze the effect of direct democracy on policy outcomes that avoids the bias of previous studies even when institutions do not vary much over time. We outline an analytical framework that provides a rigorous derivation of voter preferences from an economic choice model and shows how preference parameters can be consistently estimated from data on ballot propositions.

Using data on federal referendums in Switzerland, we provide direct evidence that voter

preferences differ between cantons with and without a mandatory budget referendum. Cantons with stronger direct democratic institutions have a lower taste for government. If we exclude voter preferences, we find similar large estimates to those reported in the literature, which we show suffer from omitted variable bias. Controlling for heterogeneity in voter preferences cuts down the influence of direct democratic institutions on government spending by more than 40 percent.

However, direct democracy still decreases spending by 10 percent even holding voter preferences constant. At the same time, direct democracy at the canton level also increases expenditures at the local level by 20 percent. The net effect on combined expenditures is zero. The main effect of a mandatory budget referendum is thus to decentralize spending. These results are found to be very robust to changes in specifications, the inclusion of additional controls and definition of voter preferences.

Both demand and supply are important determinants of fiscal policy and the size of government. Our results speak against a pure median voter model and provide support for a model, in which direct democratic control over the budgetary process affects fiscal policy.

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A Canton-Level Panel Data

The canton level data on expenditures and revenues are taken from the annual collections on public finances of Switzerland (Federal Department of Finance, various years). Expenditures for cantons and communities are reported together in 1967 and 1968 and local expenditures are missing before 1952, 1953, 1955 and 1959. Similarly, while revenues at the local level were only collected after 1977, while revenues from fees are unavailable for 1950-1952, 1968-1969, federal subsidies for 1950-1952, 1968-1977, 1990-1993 and local tax revenues are available for all years except 1950 and 1972-1976. All values for missing years were obtained by linear

interpolation. Both expenditure and revenue categories are expressed per capita and deflated to 2000 Swiss Francs (SFr) using the annual consumer price index.

Information on eligible popoluation and turnout in national or cantonal elections are from the Swiss Bureau of Statistics with values for non-election years interpolated. The variables on the percentage of left-wing parties and the number of seats in the cantonal parliament were provided by Professor Ladner at the University of Berne. The variable fractionalization (available from 1950 to 1997) measures the number of parties in the cantonal parliament relative to the share of total seats won by each party and is from Vatter (2002).[39]

The data on direct democracy are taken from Trechsel and Serduelt (1999), who systematically collected information for cantons without a town-meeting from 1970 to 1996. For canton with town meetings and years not covered in Trechsel and Serduelt, we gathered data from all the Cantonal Public Record Offices and supplemented missing information from old canton laws and constitutions. Our most important measure is a dummy variable, that equals one if the canton had a mandatory budget referendum in place in that year and zero if the budget referendum was optional or the canton does not have one at all. Note that in the cantons Vaud, Wallis, and Fribourg before 1978, the referendum was only on extraordinary expenditures not specified in the budget. Since this type of referendum is much weaker than one that covers all types of expenditures, these cantons are counted as having no mandatory budget referendum. In addition, we constructed two more variables measuring the strength of direct democracy in a canton: whether the canton had a law referendum in place in a given year and the signature requirement for the voter initiative as a share of the population age 20 or older. All cantons except Vaud allow for the voter initiative at the canton level.

For the canton characteristics, most variables are from the decennial population census with intermediate values interpolated. Data for the population in rural and urban areas is only available since 1970. The education variable is measured as the percentage of people with a university degree in percentage of the population above 19. Data on average per capita income in the cantons is available since 1965. The unemployment rate was calculated as the number of registered unemployed relative to the active population from the State Secretariat for Economic Affairs after 1975 and as the number of unemployed in percentage of employed persons from the population census before 1975. Population density is measured as the log of the number of people (in 1,000) per square kilometer. Variables of the household structure are again from the population census and include: the percentage of single-parent households, the share of married people in the group older than 20, the group of divorced people in the same age group.

[39] More specifically, the index is constructed as $N = \frac{1}{1-F}$, where $F = 1 - \sum p_k^2$, and p_k is the share of seats of party k.

Table 1: Direct Democratic Instruments in Swiss Cantons, 2000

Canton	Mandatory Budget Referendum	Change in Provisions for Budget Referendum?	Mandatory Law Referendum?	Signature Requirement Voter Initiative
Aargau (AG)	Yes	Yes (1982)	Yes	3,000
Appenzell Ausserrhoden (AR)	Yes	No	Yes	300
Appenzell Innerrhoden (AI)	Yes	Yes (1979)	No	1
Basle County (BL)	No	No	Yes	1,500
Basle City (BS)	No	No	No	4,000
Bern (BE)	Yes	Yes (1995)	No	15,000
Fribourg (FR)	No	Yes (1986)	No	6,000
Geneva (GE)	No	No	No	10,000
Glarus (GL)	Yes	No	Yes	1
Graisons (GR)	Yes	No	Yes	3,000
Jura (JU)	Yes	No	No	2,000
Lucerne (LU)	Yes	Yes (1969)	No	4,000
Neuchatel (NE)	Yes	No	No	6,000
Nidwalden (NW)	Yes	No	No	250
Obwalden (OW)	Yes	Yes (1998)	No	500
Schaffhausen (SH)	Yes	No	No	1,000
Schwyz (SZ)	Yes	No	Yes	2,000
Solothum (SO)	Yes	No	Yes	3,000
St. Gallen (SG)	Yes	No	No	4,000
Ticino (TI)	No	No	No	7,000
Thurgau (TG)	Yes	No	No	4,000
Uri (UR)	Yes	No	Yes	600
Vaud (VD)	No	No	No	12,000
Valais (VS)	No	No	No	4,000
Zuerich (ZH)	Yes	Yes (1999)	No	10,000
Zug (ZG)	No	No	No	2,000

Notes: The table summarizes the key features of direct democracy in Swiss cantons. Column (1) reports whether cantons have a mandatory budget referendum in 2000, while column (2) shows whether and when cantons changed their provisions for the budget referendum between 1950 and 2000. Column (3) shows whether a canton has a mandatory law referendum in 2000 and column (4) reports the signature requirement for the voter initiative, which is available in all cantons. Two cantons, Appenzell-Innerrhoden and Glarus still held town meetings in 2000 where most political decisions are made directly by the citizens. Aargau and Obwalden abolished town meetings in 1997, Nidwalden in 1995.

Table 2: Summary Statistics by Institutional Regime

	Mandatory Ref.		No Mandatory Ref.		T Statistic
	Mean	Std. Dev	Mean	Std. Dev	Difference
Expenditures Per Capita (in 2000 SFr)					
Overall	4640.7	2690.7	5753.9	3949.3	6.0
Health	616.1	442.4	957.8	1105.0	7.9
Education	876.7	588.8	1395.8	1053.3	11.2
Welfare	462.7	355.9	765.7	751.3	9.8
Administration	264.2	122.3	341.7	186.4	9.0
Local Expenditure in Canton	3538.9	1779.9	2735.2	1784.1	-7.7
Revenues and Deficit Per Capita (in 2000 SFr)					
Overall	4529.9	2648.0	5547.6	3833.0	5.6
Tax Revenues	1833.2	982.5	2990.6	2449.8	12.0
Revenues from Fees	562.5	440.7	755.0	913.0	5.0
Federal Subsidies	297.6	183.9	340.2	312.5	3.1
Local Tax Revenues	1709.3	825.9	1512.0	1060.9	-3.7
Budget Deficit	102.5	417.6	204.9	626.3	3.5
Political System					
Number of Seats in Parliament	117.2	51.0	119.5	44.8	0.8
Fractionalization of Parliament	3.5	1.1	4.0	1.5	6.8
Leftist Parties (%)	19.7	12.2	24.5	11.9	6.7
Mandatory Law Referendum?	0.7	0.0	0.3	0.0	-16.0
Signature Requirement Initiative	0.02	0.01	0.03	0.02	15.2
Cantonal Ballots Per Year	6.2	4.4	4.4	3.3	-5.3
Average Cantonal Turnout (%)	38.4	13.1	33.7	10.0	-4.4
Control Variables					
Age 0 to 19 (%)	30.0	4.8	28.2	6.1	-6.2
Age 20 to 39 (%)	29.0	2.2	30.1	2.5	7.8
Age 40 to 64 (%)	28.3	2.0	29.6	2.9	9.6
Age 65 to 79 (%)	10.1	1.7	9.8	2.0	-3.0
80 and Older (%)	2.5	1.1	2.4	1.2	-2.7
Log Population Density	4.8	0.8	5.6	1.4	11.6
Unemployment Rate	0.7	1.2	1.2	1.7	5.0
Foreigners (%)	12.2	4.7	16.2	8.4	11.1
Rural (%)	47.8	30.9	21.3	23.2	4.8
Catholics (%)	56.0	25.5	62.9	25.2	-12.4
Single Parents (%)	5.5	0.9	6.1	1.4	10.0
Mean Annual Income	6601	10951	8872	8676	3.2
Divorced (%)	3.1	0.1	3.7	0.1	4.9
Female Labor Force Part. (%)	41.6	6.6	41.0	7.2	-1.7
Education (%University Degree)	10.5	4.7	16.1	6.8	14.3
Language: Non-German	0.1	0.0	0.5	0.0	17.9

Notes: The table reports summary statistics over the whole sample period (1950-2000) separately for cantons with mandatory budget referendum and those without. The last column reports the T-value for differences in means between the two groups of cantons. Fractionalization is measured as the number of parties relative to the number of seats in the canton parliament. The signature requirement for the voter initiative, which is allowed in all cantons, is calculated as fraction of the population over 20.Turnout refers to participation in cantonal elections for parliament. Mean annual household income at the cantonal level is reported since 1965. Log Population density is the log of people per square kilometer and divorced is the percentage of divorced people above 20.

Table 3: Regression of Factor Loadings on Canton Characteristics

	Factor 1		Factor 2		Factor 3	
	(1)	(2)	(3)	(4)	(5)	(6)
Left Party Seats in Canton Parliament (%)	-0.0042	-0.0033	0.0100	0.0110	0.0065	-0.0016
	(0.0019)*	(0.0021)	(0.0041)*	(0.0045)*	(0.0027)*	(0.0032)
Unemployment Rate	-0.0055	-0.0071	0.0753	0.084	-0.0459	-0.0715
	(0.0131)	(0.0147)	(0.0227)**	(0.0272)**	(0.0217)*	(0.0219)**
Canton Not German-Speaking	-0.0368	-0.0792	0.1911	0.1495	0.1164	0.3259
	(0.0313)	(0.0438)	(0.0662)**	(0.0885)	(0.0365)**	(0.0893)**
Catholic (%)	-0.0031	-0.0026	0.0016	0.0032	0.0029	0.0011
	(0.0008)**	(0.0009)**	(0.0018)	(0.0020)	(0.0013)*	(0.0019)
Share Above 20 Divorced	-0.0478	-0.0304	-0.0266	0.0204	0.0593	0.0974
	(0.0170)**	(0.0164)	(0.0443)	(0.0501)	(0.0323)	(0.0348)**
Age 20 to 39 (%)	-0.022	-0.027	0.079	0.084	0.010	-0.012
	(0.0060)**	(0.0068)**	(0.0193)**	(0.0217)**	(0.0129)	(0.0129)
Age 40 to 64 (%)	-0.003	-0.009	0.043	0.034	-0.054	-0.078
	(0.0062)	(0.0073)	(0.0152)**	(0.0175)	(0.0183)**	(0.0128)**
Age 65 to 79 (%)	-0.040	-0.042	0.064	0.066	0.069	0.087
	(0.0118)**	(0.0143)**	(0.0437)	(0.0454)	(0.0247)**	(0.0231)**
80 and Older (%)	0.052	0.040	-0.057	-0.059	-0.209	-0.243
	(0.0258)*	(0.0299)	(0.0739)	(0.0747)	(0.0481)**	(0.0595)**
Population Density	0.049	0.038	-0.057	-0.084	-0.064	-0.024
	(0.0215)*	(0.0207)	(0.0472)	(0.0503)	(0.0314)*	(0.0345)
Mean Cantonal Income (SFr)		0.0016		-0.0049		-0.0034
		(0.0007)*		(0.0021)*		(0.0013)*
Decade Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	115	92	115	92	115	92
R Squared	0.61	0.72	0.75	0.74	0.3	0.65
Mandatory Budget Referendum	0.0792	0.0485	-0.2397	-0.1437	0.0068	0.032
	(0.0199)**	(0.0228)*	(0.0550)**	(0.0616)*	(0.0406)	(0.0486)
Mandatory Law Referendum		0.0216		-0.1363		0.0269
		(0.0220)		(0.0595)*		(0.0469)
Signature Requirement for Voter Initiative		-1.7627		3.4156		2.5224
		(0.6536)**		(1.7681)		(1.3943)

Notes : The top panel reports least-squares estimates where the dependent variable are the factor loadings for each canton and decade from 1950 to 2000. The independent variables are the decennial canton means. The omitted age group is 0-19 years. The income variable is missing for first decade. Standard errors are corrected for clustering at the cantonal level and all specifications contain decade dummies. The bottom panel reports the correlation between the factor loadings and several direct democratic instruments available in the canton. The two referendum variables are dummy variables equal to one if the canton provides for a referendum of the specified type and zero otherwise. The signature requirement for the voter initiative is expressed as a fraction of the population above 20.

Table 4: Voter Preferences, Direct Democracy and Fiscal Policy

Log Canton Expenditures	(1)	(2)	(3)	(4)
Mandatory Budget Referendum	-0.245	-0.144	-0.139	-0.103
	(0.061)**	(0.050)**	(0.047)**	(0.040)*
Voter Preferences		0.447		0.399
		(0.077)**		(0.076)**
Population Density			0.205	0.174
			(0.031)**	(0.030)**
Federal Aid			0.407	0.396
			(0.062)**	(0.058)**
Unemployment Rate			0.034	-0.030
			(0.028)	(0.031)
Population 65 and Older			-0.002	-0.006
			(0.016)	(0.015)
Decade Dummies	Yes	Yes	Yes	Yes
Observations	124	124	124	124
R-squared	0.82	0.85	0.88	0.9

Log Canton Revenues	(1)	(2)	(3)	(4)
Mandatory Budget Referendum	-0.227	-0.126	-0.124	-0.087
	(0.061)**	(0.051)*	(0.048)*	(0.042)*
Voter Preferences		0.444		0.404
		(0.080)**		(0.079)**
Population Density			0.208	0.177
			(0.032)**	(0.032)**
Federal Aid			0.408	0.396
			(0.063)**	(0.060)**
Unemployment Rate			0.024	-0.041
			(0.028)	(0.030)
Population 65 and Older			-0.002	-0.007
			(0.017)	(0.016)
Decade Dummies	Yes	Yes	Yes	Yes
Observations	124	124	124	124
R-squared	0.81	0.87	0.85	0.9

Notes: The table reports least squares estimates of cantonal preferences, whether the canton has a mandatory budget referendum in place and controls on canton expenditures per capita (top panel) and canton deficit per capita (bottom panel). Estimation is pooled across decade and canton and all regressions include decade dummies (not reported). Voter preferences are estimated using factor analysis and standard errors are bootstrapped to account for the first-stage estimation. Coefficients with * are significant at the 5 percent level and those with ** at the 1 percent level.

Table 5: Direct Democracy and Fiscal Policy: Interaction Effect

	Log Expenditures				Log Revenues			
Canton Level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Budget Referendum	-0.082			-0.103	-0.067			-0.088
	(0.0355)*			(0.0397)*	(0.037)			(0.0407)*
Voter Preferences	0.645	0.337	0.478		0.641	0.354	0.456	
	(0.0838)**	(0.1018)**	(0.0487)**		(0.0883)**	(0.1091)**	(0.0471)**	
Voter Preferences*Referendum	-0.416				-0.406			
	(0.1144)**				(0.1214)**			
Linear Spline Preferences (Lower)				0.5681				0.612
				(0.1324)**				(0.1342)**
Linear Spline Preferences (Upper)				0.229				0.1746
				(0.172)				(0.174)
Population Density	0.158	-0.204	0.207	0.180	0.161	-0.217	0.212	0.185
	(0.0311)**	(0.0669)**	(0.0181)**	(0.0306)**	(0.0328)**	(0.0687)**	(0.0200)**	(0.0319)**
Federal Aid	0.374	-0.039	0.295	0.418	0.374	-0.052	0.282	0.421
	(0.0572)**	(0.081)	(0.0592)**	(0.0610)**	(0.0594)**	(0.082)	(0.0692)**	(0.0627)**
Unemployment Rate	-0.028	0.033	0.034	-0.031	-0.040	0.017	0.031	-0.041
	(0.028)	(0.044)	(0.024)	(0.031)	(0.028)	(0.045)	(0.023)	(0.031)
Population 65 and Older	-0.008	-0.016	0.006	-0.008	-0.008	-0.016	0.006	-0.009
	(0.015)	(0.015)	(0.010)	(0.016)	(0.015)	(0.015)	(0.012)	(0.016)
Decade Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	124	78	46	124	122	78	46	124
R-squared	0.91	0.91	0.98	0.9	0.90	0.91	0.98	0.9

Notes : The dependent variable in the first 3 columns are log canton expenditures and log canton revenues in the last 3 columns. Column (1) and (5) add to the specification in Table 4 an interaction effect between voter preferences and having a mandatory budget referendum to control for additional preference heterogeneity. Column (2),(3) report results from a switching regression where the coefficient on all variables are allowed to differ between cantons with (column 2) and without mandatory budget referendum (column 3). Column (4) estimates a linear spline for voter preferences to allow for nonlinear effects on fiscal policy. Column (6) and (7) reports the switching regression results for log canton revenues as the dependent variable, while . All specifications include decade dummies. Standard errors are bootstrapped to account for the first-stage estimation of voter preferences. Coefficients with ** are signficant at the 1 percent level, those with * at the 5 percent level. See also notes to Table 4.

Table 6: Preferences, Direct Democracy and the Scope of Government

	Local Expenditures			Local + Canton Expenditures		
Log Expenditures	(1)	(2)	(3)	(4)	(5)	(6)
Mandatory Budget Referendum	0.304	0.173	0.218	-0.093	-0.021	0.014
	(0.108)**	(0.068)*	(0.065)**	(0.039)*	(0.039)	(0.032)
Voter Preferences			0.484			0.374
			(0.111)**			(0.057)**
Population Density		-0.412	-0.450		0.090	0.061
		(0.088)**	(0.082)**		(0.022)**	(0.019)**
Federal Aid		-0.719	-0.733		0.146	0.135
		(0.140)**	(0.128)**		(0.048)**	(0.040)**
Unemployment Rate		0.113	0.035		0.057	-0.003
		(0.045)*	(0.043)		(0.019)**	(0.019)
Population 65 and Older		-0.007	-0.012		0.005	0.001
		(0.018)	(0.018)		(0.011)	(0.010)
Observations	124	124	124	124	124	124
R-squared	0.6	0.78	0.81	0.89	0.91	0.94

	Local Tax Revenues			Local + Canton Tax Revenues		
Log Revenues	(1)	(2)	(3)	(4)	(5)	(6)
Mandatory Budget Referendum	-0.436	-0.246	-0.178	-0.228	-0.076	-0.033
	(0.090)**	(0.065)**	(0.049)**	(0.060)**	(0.046)	(0.038)
Voter Preferences			0.741			0.478
			(0.088)**			(0.066)**
Population Density		0.226	0.168		0.144	0.106
		(0.045)**	(0.037)**		(0.025)**	(0.019)**
Federal Aid		0.040	0.018		-0.062	-0.076
		(0.087)	(0.074)		(0.050)	(0.039)
Unemployment Rate		0.074	-0.045		0.077	0
		(0.037)*	(0.040)		(0.021)**	(0.024)
Population 65 and Older		0.043	0.036		0.021	0.016
		(0.023)	(0.020)		(0.012)	(0.009)
Observations	124	124	124	124	124	124
R-squared	0.7	0.83	0.89	0.79	0.9	0.94

Notes: The table reports least-squares estimates of the mandatory budget referendum, voter preferences, decade dummies (not reported) and controls (reported) on the fiscal policy outcome specified. The specifications are the same as in Table 4. All standard errors are bootstrapped to account for the first-stage estimation of voter preferences. Parameters with ** are signfiicant at the 1 percent level, those with * at the 5 percent level. See also notes to Table 4.

Table 7: Additional Controls

	Add Demographics		Add Nongerman		Add Income		Add % Left	
Log Canton Expenditures	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mandatory Budget Referendum	-0.180	-0.133	-0.188	-0.187	-0.140	-0.105	-0.171	-0.121
	(0.046)**	(0.046)**	(0.053)**	(0.050)**	(0.053)**	(0.049)*	(0.042)**	(0.042)**
Voter Preferences		0.332		0.459		0.339		0.347
		(0.083)**		(0.093)**		(0.090)**		(0.083)**
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Decade Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	124	124	124	124	99	99	114	114
R Squared	0.89	0.91	0.89	0.91	0.75	0.78	0.91	0.92

Notes: The table reports least-squares estimates where the dependent variable is log canton expenditures. All specifications contain decade fixed effects and the same controls as in Table 4. Odd columns only include the indicator for mandatory budget referendum, even columns also voter preferences. Column (1,2) adds the fraction of university graduates and catholics as well as the share of divorcees and single parent households. Column (3,4) adds a dummy whether the majority in the canton is German-speaking or not. Column (5,6) adds mean cantonal income, which is available after 1960. Column (7,8) adds the percentage of left-party seats in the cantonal parliament and the fractionalization of the parliament to the benchmark. Standard errors are bootstrapped to account for the estimated voter preferences. See also notes to previous tables.

Table 8: Specifications Tests

	Add Lawref, Initiative		Split Sample		Drop Switchers		Reduced-Form	
Log Canton Expenditures	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mandatory Budget Referendum	-0.2035	-0.1661			-0.1749	-0.1231		
	(0.0436)**	(0.0431)**			(0.0490)**	(0.0449)**		
Mandatory Only			-0.1937	-0.1615				
			(0.0509)**	(0.0434)**				
Both Mandatory and Optional			-0.0678	-0.0204				
			(0.0613)	(0.0575)				
Voter Preferences		0.4258		0.4346		0.4076	0.4249	0.4403
		(0.0723)**		(0.0708)**		(0.0811)**	(0.077)**	(0.076)**
Preferences * Budget Referendum								
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Decade Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	121	121	124	124	118	118	124	122
R Squared	0.88	0.91	0.88	0.91	0.88	0.9	0.9	0.9

Notes: The table reports least-squares estimates where the dependent variable is log canton expenditures. All specifications contain decade fixed effects and the same controls as in Table 4. Columns (1),(3),(5) only include the indicator for mandatory budget referendum, columns (2), (4), (6) also voter preferences. Column (1,2) adds other instruments of direct democracy: whether the canton has a mandatory law referendum and the signature requirement for the voter initiative relative to the population above 20. Column (3,4) split the indicator for a mandatory budget referendum into two groups: cantons that only have a mandatory and those with both a mandatory and optional budget referendum. Column (5,6) drops observations that switch between a mandatory and an optional budget referendum in a decade. Column (7) and (8) estimate a reduced-form specification of fiscal policy outcomes on voter preferences, canton dummies and the same controls as in Table 4. Column (8) adds whether the canton has a law referendum in place and the signature requirement for the voter initiative in percent of the population above 20. See also notes to previous tables.

Table 9: Federal and Cantonal Votes on Fiscal Policy Propositions

	Level		Characteristics		Voter	Percentage
	Federal	Cantonal	Year	Type	Turnout	Yes Votes
Subsidizing Public Transport						
Canton Aargau (Mandatory Budget Referendum)	X		1998	Referendum	39.6%	53%
	X		1991	Initiative	25.2%	34%
		X	1975	Referendum	32.0%	61%
		X	1996	Referendum	24.7%	64%
Subsidy for Education and Vocational Training						
Canton Aargau (Mandatory Budget Referendum)	X		1985	Referendum	38.9%	47%
		X	1978	Referendum	46.2%	46%
Tax on Wealthy Households						
Canton Aargau (Mandatory Budget Referendum)	X		1977	Initiative	36.2%	41%
		X	1974	Referendum	26.7%	11%
Tax on Wealthy Households						
Canton Basle City (Optional Referendum)	X		1977	Initiative	35.0%	50%
		X	1977	Initiative	44.0%	37%
Subsidies for Home Construction						
Canton Bern (Switched from Mandatory to Optional Referendum)	X		1950	Referendum	38.1%	52%
		X	1971	Referendum	48.5%	73%
Subsidy for Cultural Activities						
Canton Neuchatel (Mandatory Budget Referendum)	X		1994	Referendum	37.4%	58%
		X	1991	Referendum	12.8%	56%

Source: Online Database of Voting Outcomes in Federal Propositions; Database on Cantonal Ballots at the University of Berne.

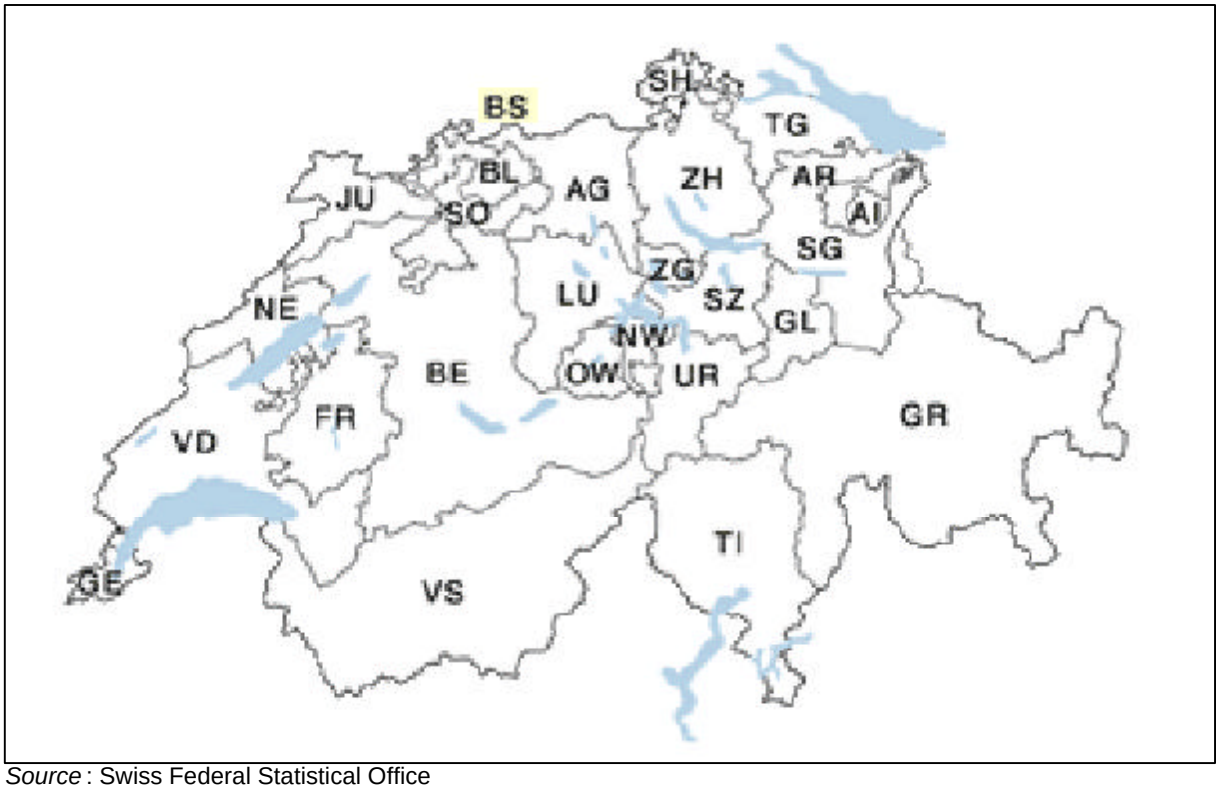
Notes: The table compares the voting behavior in cantonal and federal referendums on similar propositions. Column (1) shows the title and canton where the proposition was held. Columns (2) and (3) report, whether the vote was at the federal or cantonal level. The next two columns show the year of vote and type of proposition. The last two columns report the turnout and the percentage supporting the respective proposition. Turnout is calculcated as the percentage of voters in federal propositions and as the number of valid votes as percentage of the eligible population in the cantonal ones. Over the period 1970 to 1996, citizens in the mostly rural, German-speaking canton Aargau voted on 133 cantonal propositions, in the urban, German-speaking cantons of Basel-Stadt and Bern on 202 and 200 respectively and in the mostly French-speaking canton Neuenbourg on 115.

Table 10: Alternative Measure of Voter Preferences

	(1)	(2)	(3)	(4)	(5)
Mandatory Budget Referendum			-0.241	-0.213	-0.17
			(0.025)**	(0.014)**	(0.014)**
Support More Federal Spending	2.561	0.407			2.277
	(0.221)**	(0.198)*			(0.195)**
Population Density	0.125	-0.031		0.137	0.107
	(0.019)**	(0.160)		(0.020)**	(0.019)**
Federal Aid	0.319	0.08		0.335	0.32
	(0.043)**	(0.031)**		(0.043)**	(0.042)**
Unemployment Rate	-0.047	-0.006		0.016	-0.065
	(0.010)**	(0.004)		(0.007)*	(0.008)**
Population 65 and Older	0.016	-0.022		0.036	0.026
	(0.007)*	(0.007)**		(0.007)**	(0.007)**
Year Dummies	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	No	Yes	No	No	No
Observations	825	825	825	825	825
R-squared	0.67	0.96	0.26	0.63	0.71

Notes: The estimates reported in the table are based on annual panel data where the dependent variable is log annual expenditures at the canton level. The variable "Support More Federal Spending" is measured as the fraction voting yes in propositions that would increase federal spending. All other variables are defined as before (see notes to previous tables). Column (2) adds canton fixed effects to control for unobserved heterogeneity across cantons. Column (3) shows the raw effect of a mandatory budget referendum on expenditures per capita. Column (4) add the same controls as before and column (5) political preferences to the specification. All specifications include decade dummies. Robust standard errors are reported in parentheses. Estimates with * are statistically significant at the 5 percent level, those with ** at the 1 percent level.

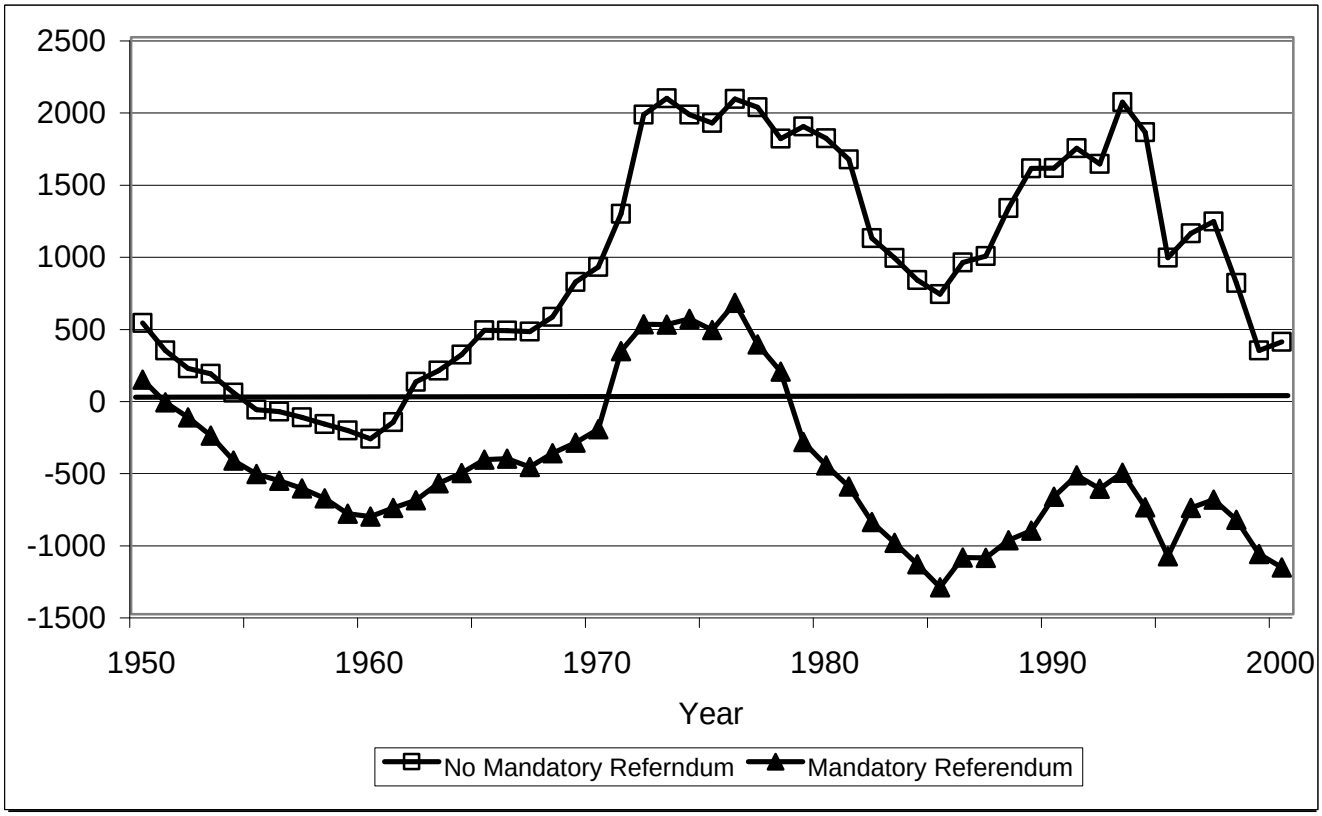
Figure 1: Map of Swiss Cantons



Source : Swiss Federal Statistical Office

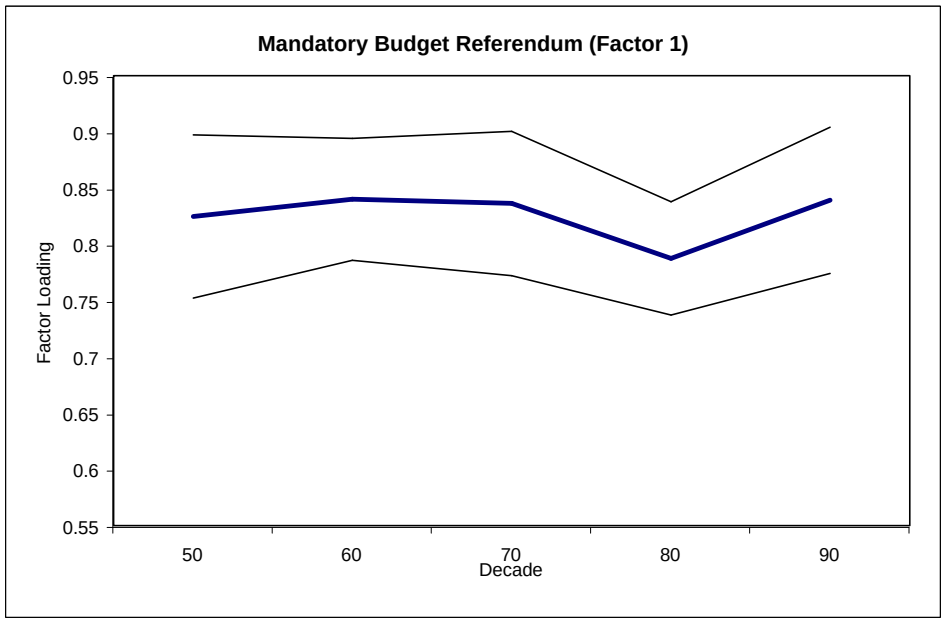
Notes : The map shows the 26 cantons of Switzerland. Cantons with both mandatory budget and law referendum are Aargau (AG), Appenzell Ausserrhoden (AR), Glarus (GL), Grisons (GR), Schwyz (SZ), Solothurn (SO), Uri (UR), those with mandatory budget but no mandatory law referendum are Appenzell Innerrhoden (AI), Bern (BE), Jura (JU), Lucerne (LU), Neuchatel (NE), Nidwalden (NW), Obwalden (OW), Schaffhausen (SH), St. Gallen (SG) and Thurgau (TG). Finally, cantons without either of these are Basle City (BS), Geneva (GE), Ticino (TI), Vaud (VD), Valais (VS) and Zug (ZG).

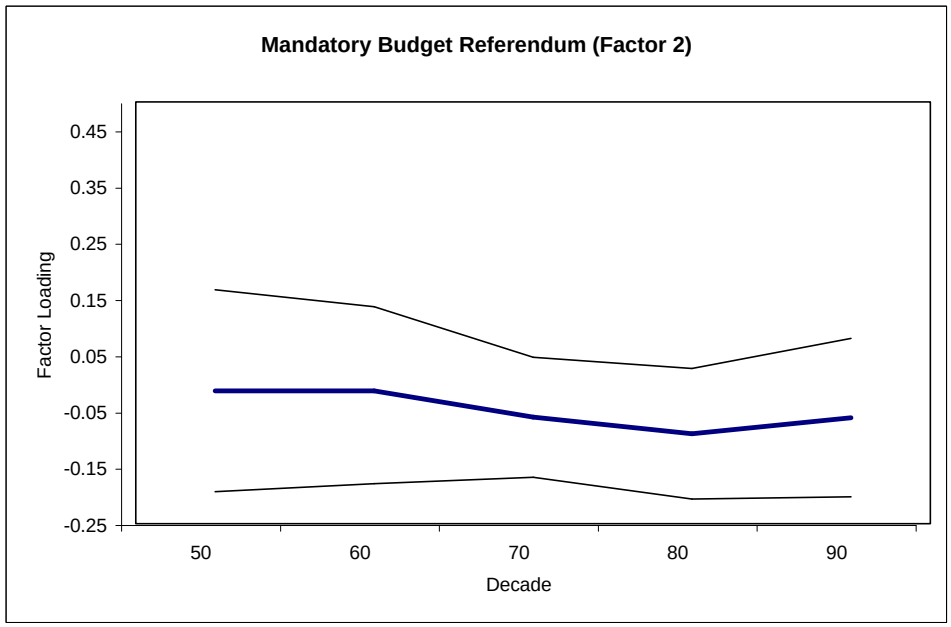
Figure 2: Real Expenditure Per Capita by Institutional Regime

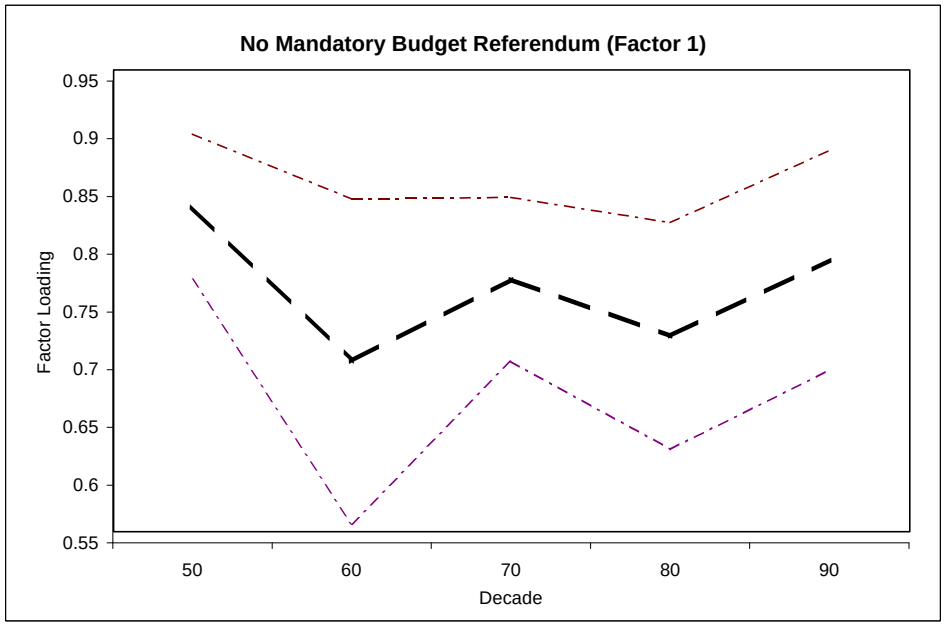


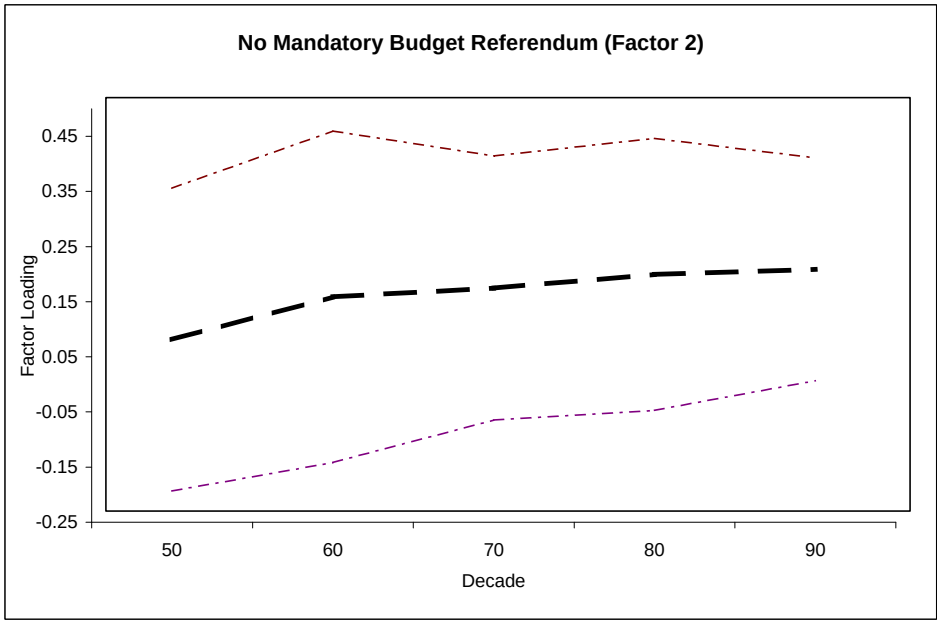
Notes: The figure reports real per-capita expenditures in 2000 Swiss Francs (1 SFr = US$ 0.85 in 2005) after taking out a common linear trend. Cantons are classified according to whether they have a mandatory budget referendum in the particular year (see Table 1 for details).

Figure 3: Evolution of Voter Preferences over Time and by Institutional Regime









Notes : The two figures compares the evolution of voter preferences (Factor 1 and 2) by decade from 1950 to 2000 for cantons with mandatory budget referendum (top panel) and without (bottom panel). The thick line represents the mean, the thin lines the pointwise 95% confidence intervals.

Table A1: Estimation Results of Factor Analysis

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Eigenvalue					
1950s	18.308	3.096	1.380	0.747	0.625
1960s	16.795	3.163	1.419	1.251	0.946
1970s	17.664	1.806	0.926	0.743	0.584
1980s	15.522	2.149	1.476	0.868	0.657
1990s	18.039	2.210	0.993	0.503	0.318
Fraction of Variance Explained					
1950s	0.725	0.123	0.055	0.030	0.025
1960s	0.653	0.123	0.055	0.049	0.037
1970s	0.748	0.076	0.039	0.032	0.025
1980s	0.661	0.092	0.063	0.037	0.028
1990s	0.780	0.096	0.043	0.022	0.014
Cumulative Variance Explained					
1950s	0.725	0.848	0.903	0.932	0.957
1960s	0.653	0.776	0.831	0.880	0.917
1970s	0.748	0.824	0.863	0.895	0.919
1980s	0.661	0.753	0.816	0.853	0.881
1990s	0.780	0.876	0.919	0.941	0.954
Mean Factor Loading					
1950s	0.831	0.023	0.010	0.015	0.000
1960s	0.789	0.048	0.015	0.000	0.001
1970s	0.816	0.021	0.006	0.008	0.001
1980s	0.766	0.023	0.002	0.007	0.004
1990s	0.824	0.032	0.006	0.005	0.002

Notes: The table contains the eigenvalues, variance explained by the first five factors and unrotated factor loadings, which consistently estimate cantonal preference parameters for each decade. The estimation method was principal factor, but iterated principal factor or principal components yielded very similar results and are available upon request. Estimation is based on 20 propositions in the 1950s, 22 in the 1960s, 78 in the 1970s, 63 in the 1980s and 105 in the 1990s. To ensure comparability over time, the voting recommendations of the Evangelical Party are included.

Table A2: Federal Propositions with Higher Government Spending

Number	Title of Proposition	Year	Percentage	Outcome
294	Subsidize Hiking Trails	1979	76%	Yes
305	For a new Immigration Policy	1981	16%	No
313	Energy Article	1983	49%	No
323	Protection Motherhood	1984	15%	No
339	Culture Initiative	1986	43%	No
340	Secure Vocational Training and Retraining	1986	17%	No
342	Protection of Renters	1986	63%	Yes
348	Railway 2000	1987	56%	Yes
349	Protection Moor	1987	57%	Yes
350	Reform Health Insurance	1987	28%	No
352	Decrease Retirement Age	1988	35%	No
363	Vine Cultivation	1990	46%	No
367	Energy Article	1990	71%	Yes
368	Traffic Law	1990	52%	Yes
370	Promoting Public Transport	1991	37%	No
373	Financing of Health Insurance	1992	39%	No
377	Protection of Waters	1992	66%	Yes
381	Saving the Waters	1992	37%	No
382	Building Railway through the Alps	1992	63%	Yes
386	Raise Salary of Parliamentary Members	1992	27%	No
387	Improve Infrastructure for Parliamentary Members	1992	30%	No
410	Promote Culture	1994	50%	No
415	Health Insurance	1994	51%	Yes
416	For a new Health Insurance	1994	23%	No
423	Securing Invalidity/Age Insurance	1995	27%	No
430	For an Environmentally Oriented Agriculture	1996	77%	Yes
431	Re-Organisation Administration	1996	39%	No
444	Reform of Age Insurance	1998	41%	No
445	Infrastructure for Public Transportation	1998	63%	Yes
458	Law on Insurance of Motherhood	1999	38%	No
469	For a flexible Age Insurance	2000	39%	No
470	For a flexible Retirement Age	2000	46%	No

Notes : The table lists the federal propositions, which would have increased government spending. The financial consequences of a proposition were assessed using the official documents by the federal government (available at http://www.ads.bar.admin.ch/ADS/showHome.do), which are distributed to each citizen before the vote. Column (4) contains the percentage of voters supporting the proposition.